Preface

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Version 1.0

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of Conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation

Canadian Department of Communications

This class B digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilieur du Canada.

About the Manual

The manual consists of the following:

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Introducing the Motherboard
Describes features of the motherboard
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Chapter 2
Installing the Motherboard
Describes installation of motherboard components
Go to ⇨ page 7

Chapter 3
Using BIOS
Provides information on using the BIOS Setup Utility
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Describes the motherboard software
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ATI Crossfire™ Technology Support
Describes the ATI Crossfire™ Technology
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Memo

Chapter 1
Introducing the Motherboard

Introduction

Thank you for choosing **P55H-AK** motherboard. This motherboard is a high performance, enhanced function motherboard designed to support the LGA1156 socket for **Intel® Unlocked Core-i7 / Core-i5 processors** to reach the optimum system performance. Combined with ECS unique **M.I.B X* BIOS** interface, it makes a simple, fast and safe O.C platform for high-end desktop and gaming market.

P55H-AK is based on **Intel P55 Express Chipset** and **NVIDIA nForce® 200** PCI Express switch chip to generate three of PCIe 16X Gen 2 graphic interface, **supporting 3-Way / 2-Way NVIDIA® SLI™ and ATI CrossfireX™ technology** that allows you install up to three graphic cards with identical GPU running at PCIe Gen 2 speed. It supports up to 16 GB of system memory with **dual channel DDR3 2400 (OC) / 2200 (OC) / 2000 (OC) / 1800 (OC) / 1600 (OC) / 1333 / 1066 MHz** memory modules. It provides one PCI rev 2.3 slot and two PCI Express x1 rev 2.0 slots for extending usage.

P55H-AK implements extra **NEC UPD720200F1 USB3.0** and **Marvell 88SE9128 SATA 6Gb/s** chips, which provide four USB 3.0 ports (two USB 3.0 ports and one USB 3.0 header for two frontal USB 3.0 ports), **two SATA 6Gb/s** and **two eSATA 6Gb/s** ports with RAID 0, 1 configuration, through **PLX PEX 8608** PCIe Gen 2 switch, this motherboard delivers the highest data transfer rate to fulfill the most speed-demanding usage.

The motherboard is equipped with advanced full set of I/O ports in the rear panel, including one PS/2 mouse and keyboard combo connector, one **CLR_CMOS button**, **two eSATA 6Gb/s ports**, two gigabit LAN ports, eight USB 2.0 ports, **two USB 3.0 ports running at 5Gb/s**, one optical SPDIFO port and audio jacks for microphone, line-in and 8-ch line-out.

** ECS M.I.B X stands for extreme O.C BIOS interface. Please refer to chapter 3 for detailed setup information.*

Specifications

CPU	• Accommodates Intel® Core™ i7 / Core™ i5 / Core™ i3 / Pentium series processors in the LGA1156 package • Supports Unlocked Intel® Core™ i7 / Core™ i5 Processors • Supports "Hyper-Threading" technology CPU • Supports Intel® Turbo Boost Technology • Supports Intel® Smart Cache
Chipset	• Intel P55 Express Chipset
Extra Chips	• NVIDIA nForce® 200 PCI Express switch chip with extra 32 PCIe lanes - Programming support for NVIDIA® SLI™ technology - Full 64-bit addressing - Supports the PCI Express power management capability • PLX PEX 8608 PCIe Gen 2 switch - Offers 8 PCI Express Gen2 (5.0GT/s) lanes - Supports Read Pacing™ Technology - Supports packet cut-thru with the industry's lowest latency of 140ns (x4 to x1)
Memory	• Dual-channel DDR3 memory architecture • 4 x 240-pin DDR3 DIMM sockets support up to 16 GB • Supports DDR3 2400 (OC) / 2200 (OC) / 2000 (OC) / 1800 (OC) /1600 (OC) / 1333 /1066 DDR3 SDRAM • Supports Intel® Extreme Memory Profile (XMP) memory modules • Supports 1 Gb, 2 Gb and 4 Gb DDR3 DRAM technologies for x8 and x16 devices (It is not recommended to use 512 Mb DDR3 memory device on this motherboard)
Expansion Slots	• 3 x PCI Express x16 Gen 2 slots (PCIEX16_1, PCIEX16_2, PCIEX16_3 run at x16, x8, x8 speed) • 2 x PCI Express x 1 slots • 1 x PCI slot
Storage	• Supported by Intel P55 Express Chipset - 6 x Serial ATA 3.0 Gb/s Host Controllers - Supports SATA RAID 0, 1, 5 and 10 • Supported by Marvell 88SE9128 and PLX PEX 8608 - 2 x Serial ATA 6.0Gb/s ports supporting 2 xSATA 6.0Gb/s device - 2 x eSATA 6.0Gb/s ports supporting external SATA 6.0Gb/s devices - Supports SATA RAID 0 and 1

USB	• Supported by Intel P55 Express Chipset - 12 USB 2.0 ports (8 ports at the back panel and 2 USB 2.0 headers supporting additional 4 ports). - Supported by NEC UPD720200F1 USB 3.0 chip - 2 USB 3.0 / 2.0 ports at the back panel - 1 USB 3.0 header supporting additional 2 ports compatible to both USB 3.0 / 2.0 devices
Audio	• Realtek ALC889 supports 7.1 channel HD audio – 7.1+2 channel multi-streaming enables concurrent gaming/ VoIP - All ADCs supports 44.1k/48k/88.2k/96k/176.4k/195KHz sample rate - Capability for “full rate” BluRay DVD/HD DVD support. - Meets Microsoft WLP3.10 and future WLP audiorequirements
Giga LAN	• Dual Gigabit LAN, Realtek RTL8111E PCIe GigaLAN controller • Supports Realtek Teaming Technology
Rear Panel I/O	• 1 x PS/2 keyboard/mouse combo port • 1 x CLR_CMOS button • 2 x eSATA 6.0Gb/s ports • 2 x USB 3.0 ports compatible to both USB 3.0 / 2.0 devices • 8 x USB 2.0 ports • 2 x RJ45 LAN connectors • 1 x Audio port with 6 audio jacks (Center/ Subwoofer Speaker Out/ Rear Speaker Out / Side Speaker Out / Line in, microphone in, line out, and optical SPDIF out)

Internal I/O Connectors & Headers	• 1 x 24-pin ATX Power Supply connector, 1 x 4-pin VGA Power Supply Connector & 1x 8-pin CPU Power Supply connector • 6 x Serial ATA 3.0 Gb/s connectors • 2 x Serial ATA 6.0 Gb/s connectors • 1 x USB 3.0 headers support additional 2 USB 3.0 ports • 2 x USB 2.0 headers support additional 4 USB 2.0 ports • 1 x Clear CMOS header • 1 x power button • 1 x reset button • 1 x Front panel switch/LED header • 1 x SPDIF out header • 1 x Front panel audio header • 1 x buzzer • CPU_FAN/SYS_FAN/PWR_FAN / CASE_FAN connectors
System BIOS	• AMI BIOS with 16Mb SPI ROM • Supports Plug and Play 1.0A, APM 1.2, Multi Boot, DMI • Supports ACPI revision 1.0 specification
Form Factor	• ATX Size, 305mm x 244mm

1.Some hardware specifications and software items are subject to change without prior notice.

2.Due to chipset limitation, we recommend that motherboard be operated in the ambiance between 0 and 50° C.

Motherboard Components

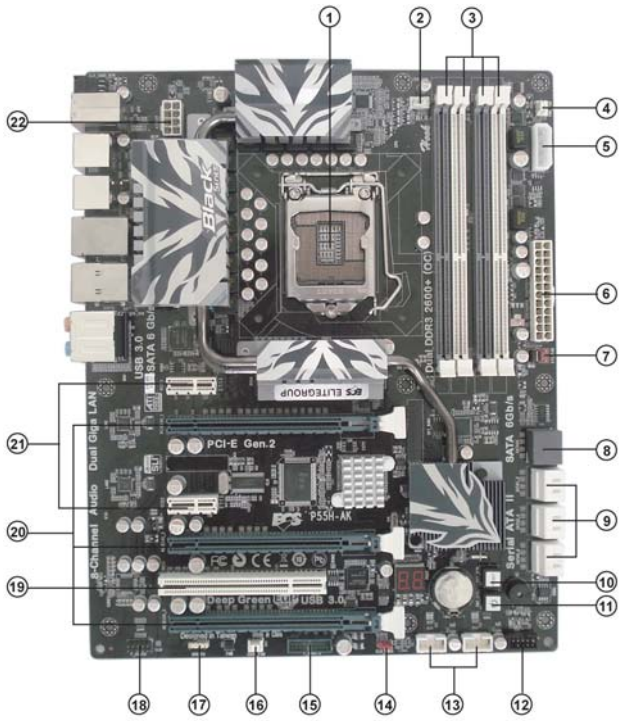


Table of Motherboard Components

LABEL	COMPONENTS
1. CPU Socket	Intel® Core™ i7 / Core™ i5 / Core™ i3 / Pentium series processor in the LGA1156 package
2. CPU_FAN	CPU cooling fan connector
3. DDR3_2/1/4/3	240-pin DDR3 SDRAM slots
4. PWR_FAN	Power cooling fan connector
5. ATX4P	Auxiliary power connector for graphics card
6. ATX_POWER	Standard 24-pin ATX power connector
7. SYS_FAN	System cooling fan connector
8. SATA6G	Serial ATA 6.0Gb/s connector
9. SATA1~6	Serial ATA 3.0Gb/s connectors
10. RST_BTN	Reset button
11. PWR_BTN	Power on button
12. F_PANEL	Front panel switch/LED header
13. F_USB1~2	Front panel USB 2.0 headers
14. CLR_CMOS	Clear CMOS jumper
15. F_USB3.0	Front panel USB 3.0 header
16. CASE_FAN	Case cooling fan connector
17. SPDIFO	SPDIF out header
18. F_AUDIO	Front panel audio header
19. PCI1	32-bit add-on card slot
20. PCIE16X_1~3	PCI Express slots for graphics interface
21. PCIE1~2	PCI Express x1 slots
22. ATX12V	8-pin +12V power connector

This concludes Chapter 1. The next chapter explains how to install the motherboard.

Chapter 2
Installing the Motherboard

Safety Precautions

- Follow these safety precautions when installing the motherboard
- Wear a grounding strap attached to a grounded device to avoid damage from static electricity
- Discharge static electricity by touching the metal case of a safely grounded object before working on the motherboard
- Leave components in the static-proof bags they came in
- Hold all circuit boards by the edges. Do not bend circuit boards

Choosing a Computer Case

There are many types of computer cases on the market. The motherboard complies with the specifications for the ATX system case. Some features on the motherboard are implemented by cabling connectors on the motherboard to indicators and switches on the system case. Make sure that your case supports all the features required.

Most cases have a choice of I/O templates in the rear panel. Make sure that the I/O template in the case matches the I/O ports installed on the rear edge of the motherboard.

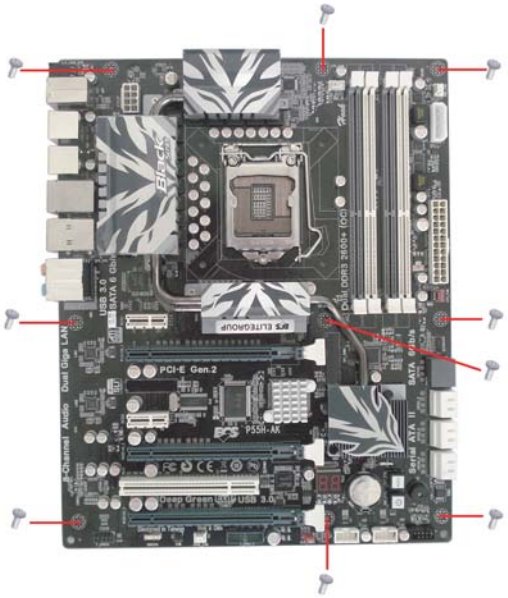
This motherboard carries an ATX form factor of 305 x 244 mm. Choose a case that accommodates this form factor.

Installing the Motherboard in a Case

Refer to the following illustration and instructions for installing the motherboard in a case.

Most system cases have mounting brackets installed in the case, which correspond the holes in the motherboard. Place the motherboard over the mounting brackets and secure the motherboard onto the mounting brackets with screws.

Ensure that your case has an I/O template that supports the I/O ports and expansion slots on your motherboard.



Do not over-tighten the screws as this can stress the motherboard.

Checking Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.

Setting Jumpers

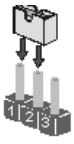
Use the motherboard jumpers to set system configuration options. Jumpers with more than one pin are numbered. When setting the jumpers, ensure that the jumper caps are placed on the correct pins.

The illustrations show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN.

SHORT

OPEN

This illustration shows a 3-pin jumper. Pins 1 and 2 are SHORT.



Checking Jumper Settings

The following illustration shows the location of the motherboard jumpers. Pin 1 is labeled.

Jumper Settings

Jumper	Type	Description	Setting (default)	
CLR_CMOS	3-pin	Clear CMOS	1-2: NORMAL 2-3: CLEAR CMOS Before clearing the CMOS, make sure to turn off the system.	1 CLR_CMOS

To avoid the system unstability after clearing CMOS, we recommend users to enter the main BIOS setting page to "Load Default Settings" and then "Save and Exit Setup".

Installing Hardware

Installing the Processor

Caution: When installing a CPU heatsink and cooling fan make sure that you DO NOT scratch the motherboard or any of the surface-mount resistors with the clip of the cooling fan. If the clip of the cooling fan scrapes across the motherboard, you may cause serious damage to the motherboard or its components.

On most motherboards, there are small surface-mount resistors near the processor socket, which may be damaged if the cooling fan is carelessly installed.

Avoid using cooling fans with sharp edges on the fan casing and the clips. Also, install the cooling fan in a well-lit work area so that you can clearly see the motherboard and processor socket.

Before installing the Processor

This motherboard automatically determines the CPU clock frequency and system bus frequency for the processor. You may be able to change the settings in the system Setup Utility. We strongly recommend that you do not over-clock processors or other components to run faster than their rated speed.

Warning:

1. Over-clocking components can adversely affect the reliability of the system and introduce errors into your system. Over-clocking can permanently damage the motherboard by generating excess heat in components that are run beyond the rated limits.

2. Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.

This motherboard has an LGA1156 socket. When choosing a processor, consider the performance requirements of the system. Performance is based on the processor design, the clock speed and system bus frequency of the processor, and the quantity of internal cache memory and external cache memory.

Fail-Safe Procedures for Over-clocking

When end-users encounter failure after attempting over-clocking, please take the following steps to recover from it.

1. Shut down the computer.

2. Press and hold the “Page Up Key (PgUp)” of the keyboard, and then boot the PC up.

3. Two seconds after the PC boots up, release the “Page Up Key (PgUp)”.

4. The BIOS returns to the default setting by itself.

CPU Installation Procedure

The following illustration shows CPU installation components.

A. Opening of the Load Plate
- Put your thumb on the tail of the load plate and press the tail down.
- Rotate the load plate to fully open position.

B. Disengaging of the Load Lever
- Hold the hook of lever and pull it to the left side to clear retention tab.
- Rotate the load lever to fully open position.

C. Removing the Cap
- Be careful not to touch the contact at any time.

D. Inserting the Package
- Grasp the package. Ensure to grasp on the edge of the substrate.
- Make sure pin 1 indicator is on your bottom-left side.
- Aim at the socket and place the package carefully into the socket by purely vertical motion.

E. Closing the Load Plate
- Rotate the load plate onto the package IHS (Intergraded Heat Spreader).
- Engage the load lever while pressing down lightly onto the load plate.
- Secure the load lever with the hook under retention tab.

F. Fasten the cooling fan supporting base onto the CPU socket on the motherboard.

G. Make sure the CPU fan is plugged to the CPU fan connector. Please refer to the CPU cooling fan user's manual for more detail installation procedure.

1. To achieve better airflow rates and heat dissipation, we suggest that you use a high quality fan with 3800 rpm at least. CPU fan and heatsink installation procedures may vary with the type of CPU fan/ heatsink supplied. The form and size of fan/heatsink may also vary.

2. DO NOT remove the CPU cap from the socket before installing a CPU.

3. Return Material Authorization (RMA) requests will be accepted only if the motherboard comes with the cap on the LGA1156 socket.

Installing Memory Modules

This motherboard accommodates four memory modules. It can support four 240-pin DDR3 2400 (OC)/ DDR3 2200 (OC)/DDR3 2133 (OC)/DDR3 2000 (OC)/DDR3 1800 (OC)/1600 (OC)/1333/1066 SDRAM. The total memory capacity is 16 GB.

DDR3 SDRAM memory module table

Memory module	Memory Bus
DDR3 2400	***1200 MHz***

You must install at least one module in any of the four slots. Total memory capacity is 16 GB.

The four DDR3 memory sockets (DDR3_1, DDR3_2, DDR3_3 and DDR3_4) are divided into two channels and each channel has two memory sockets as following:

- Channel A: DDR3_1, DDR3_3
- Channel B: DDR3_2, DDR3_4

Recommend memory configuration

Mode	Sockets			
	DDR3_2	DDR3_1	DDR3_4	DDR3_3
1 DIMM	--	Populated	--	--
1 DIMM	--	--	--	Populated
2 DIMMs	--	Populated	--	Populated
3 DIMMs	Populated	Populated	--	Populated
3 DIMMs	--	Populated	Populated	Populated
4 DIMMs	Populated	Populated	Populated	Populated

Due to Intel CPU spec definition, the system will not boot if only one DIMM is installed in DDR3_2 or DDR3_4. Follow the table above for recommended memory configuration.

1. For best performance and compatibility, we recommend that users give priority to the white DIMMs (DDR3_1/DDR3_3) when installing DIMMs.

2. We suggest users not mix memory type. It is recommended to use the same brand and type memory on this motherboard.

Do not remove any memory module from its antistatic packaging until you are ready to install it on the motherboard. Handle the modules only by their edges. Do not touch the components or metal parts. Always wear a grounding strap when you handle the modules.

Installation Procedure

Refer to the following to install the memory modules.

1. This motherboard supports unbuffered DDR3 SDRAM .
2. Push the latches on each side of the DIMM slot down.
3. Align the memory module with the slot. The DIMM slots are keyed with notches and the DIMMs are keyed with cutouts so that they can only be installed correctly.
4. Check that the cutouts on the DIMM module edge connector match the notches in the DIMM slot.
5. Install the DIMM module into the slot and press it firmly down until it seats correctly. The slot latches are levered upwards and latch on to the edges of the DIMM.
6. Install any remaining DIMM modules.

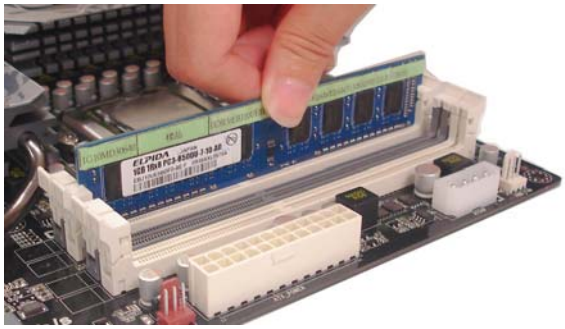


Table A: DDR3 (memory module) QVL (Qualified Vendor List)

The following DDR3 memory modules have been tested and qualified for use with this motherboard.

DDR3 800						
NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Qimonda	IMSH51U03A1F1C-08E	Qimonda	IDSH51-03A1F1C-OBE	SS	512MB
DDR3 1066						
NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Elixir	M2Y2G64CB8HC9N-BE			DS	2GB
2	Elixir	M2Y2G64CB8HC5N-BE	elixir	N2CB1G80CN-BE	DS	2GB
3	Hynix	HMT112U6AFP8C-G7N0 AA	Hynix	H5TQ1G83AFP G7C	SS	1GB
4	Hynix	HMT125U6AFP8C-G7N0 AA	Hynix	H5TQ1G83AFP G7C	DS	2GB
5	Kingston	KVR1066D3N7	Elpida	J5308BASE-AE-E 07500W220	DS	1GB
6	Micron	MT8JTF12864AY-1G1D1	Micron	7UD22D9JNL	SS	1GB
7	Micron	MT8JTF12864AY-1G1D1	Micron	8TD22 D9JNL	SS	1GB
8	Micron	MT16JTF25664AY-1G1D1	Micron	8WD22 D9JNL	DS	2GB
9	Micron	MT16JTF25664AZ-1G1F1	Micron	9EF22 D9KPV	DS	2GB
10	Micron	MT8JTF12864AZ-1G1F1	Micron	9NF22 D9KPT	SS	1GB
11	Ramaxel	RMR1810NA48E7F-1066-LF	NANYA	NT5CB128H8AN-DE	SS	1GB
12	Kingston	KVR1066D3N7/512	Elpida	J5308BASE-AE-E 07340W065	SS	512MB
13	Qimonda	IMSH1GU03A1F1C-10F	Qimonda	IDSH1G-03A1F1C-10F FSS15085	SS	1GB
14	Qimonda	IMSH1GU03A1F1C-10G	Qimonda	IDSH1G-03A1F1C-10G FSS14526	SS	1GB
15	Qimonda	IMSH2GU13A1F1C-10F	Qimonda	IDSH1G-03A1F1C-10F FSS15085	DS	2GB
16	Qimonda	IMSH2GU13A1F1C-10G	Qimonda	IDSH1G-03A1F1C-10G FSS13467	DS	2GB
17	Hynix	HYMT112U64ZNF8-G8 AA	Hynix	HY5TQ1G831ZN FP-G8	SS	1GB
18	Micron	MT16JTF25664AY-1G1D1	Micron	7UD22D9JNL	DS	2GB
19	Samsung	M378B2873EH1-CF8	SEC	HCF8K4B1G0846E	SS	1GB
20	Samsung	M378B2873DZ1-CF8	SEC	HCF8 K4B1G0846D	SS	1GB
21	Samsung	M378B5673DZ1-CF8	SEC	K4B1G0846D HCF8	DS	2GB
22	Aeneon	AEH760UD00-10FA98X	Aeneon	AEH93R10F 0737	SS	1GB
23	Elpida	EBJ10UE8BDF0-AE-F	Elpida	J1108BDSE-DJ-F	SS	1GB
24	Elpida	EBJ21UE8BDF0-AE-F	Elpida	J1108BDSE-DJ-F	DS	2GB
25	Elpida	PC3-8500U-7-00-AP	Elpida	J53088ASE-AC-E	SS	512MB
DDR3 1333						
NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Apacer	78.A1GC6.9L1	Apacer	AM5D5808ADWSBG	DS	2GB
2	Elixir	M2F2G64CB8HA4N-CG	Elixir	N2CB1G80AN-CG 0903	DS	2GB
3	Elixir	M2Y2G64CB8HC9N-CG			DS	2GB
4	Elixir	M2F2G64CB88B7N-CG	Elixir	N2CB2G80BN-CG	SS	2GB
5	Elixir	M2F4G64CB8HB5N-CG	Elixir	N2CB2G80BN-CG	DS	4GB
6	Hynix	HMT112U6AFP8C-H9N0 AA	Hynix	H5TQ1G83AFP H9C	SS	1GB
7	Hynix	HMT125U6AFP8C-H9N0 AA	Hynix	H5TQ1G83AFP H9C	DS	2GB
8	Hynix	HMT112U6TFR8C-H9N0	Hynix	H5TQ1G83TFRH9C	SS	1GB
9	G.SKILL	F3-10666CL9D-4GBRL			DS	2GB
10	G.SKILL	F3-10666CL8D-4GBECO 1.35V			DS	2GB
11	G.SKILL	F3-10666CL9D-4GBNQ			DS	2GB
12	Kingston	KVR1333D3N9/4G	Hynix	Hynix/H5TQ2G83AFR	DS	4GB
13	Nanya	NT2GC64B8HAONF-CG	Elixir	N2CB1G80AN-CG	DS	2GB
14	Micron	MT8JTF12864AY-1G4D1	Micron	8UD22 D9JNM	SS	1GB
15	Micron	MT16JTF25664AY-1G4D1	Micron	8WD22 D9JNM	DS	2GB
16	Micron	MT8JTF12864AZ-1G4F1	Micron	9MF22 D9KPT	SS	1GB
17	Samsung	M378B2873FHS-CH9	SEC	K4B1G0846F	SS	1GB
18	Samsung	M378B5673FH0-CH9	SEC	K4B1G0846F	DS	2GB
19	Samsung	M378B5273CH0-CH9	SEC	K4B2G0846C	DS	4GB
20	Nanya	M2Y2G64TU8HD5B-BD	elixir	N2CB1G80AN-CG	DS	2GB
DDR3 1333						
NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Aeneon	AXH760UD00-13GA98X			SS	1GB
2	KingMax	FLFD45F-B8KG9 NAUS	KingMax	KFB8FNGXF-ANX-15U	SS	1GB
3	KingMax	FLFE85F-B8KG9 NEUS	KingMax	KFB8FNGXF-ANX-15U	DS	2GB
4	KingMax	FLFD45F-B8KG9 NAES	KingMax	KFB8FNGXF-ANX-15A	SS	1GB
5	KingMax	FLFE85F-B8KG9 NEES	KingMax	KFB8FNGXF-ANX-15A	DS	2GB
6	KingMax	FLFE85F-B8KL9	KingMax	KFB8FNLXF-BNF-15A	DS	2GB
7	KingMax	FLFD45F-B8KL9	KingMax	KFB8FNLXF-BNF-15A	SS	1GB
8	Kingston	KVR1333D3N9	Kingston	128X8DDR3 SL0931	DS	2GB

9	Kingston	KVR1333D3N9K2/2G	Elpida	J1108BASE-DJ-E	SS	2GB
10	Kingston	KVR1333D3N9/2G	Qimonda	IDSH1G-03A1F1C-13H	DS	2GB
11	Kingston	KVR1333D3N9	Elpida	J1108BASE-DJ-E	SS	1GB
12	Kingston	KVR1333D3N9	Elpida	J1108BABG-DJ-E	DS	2GB
13	Elixir	M2Y1G64CB88A5N-CG	Elixir	N2CB1G80AN-CG	SS	1GB
14	Elixir	M2Y2G64CB8HA5N-CG	Elixir	N2CB1G80AN-CG	DS	2GB
15	PSC	AL7F8G73D-DG1	PSC	A3P1GF3DGF	SS	1GB
16	PSC	AL8F8G73D-DG1	PSC	A3P1GF3DGF	DS	2GB
17	Nanya	NT1GC64B88A0NF-CG	Nanya	NT5CB128M8AN-CG	SS	1GB
18	Qimonda	IMSH1GU13A1F1C-13H	Qimonda	0734 IDSH51-03A1F1D	DS	1GB
19	Qimonda	IMSH2GU13A1F1C-13H	Qimonda	IDSH1G-03A1F1C-13H FSS08244	DS	2GB
20	Samsung	M378B2873DZ1-CH9	SEC	K4B1G0846D	SS	1GB
21	Samsung	M378B2873EH1-CH9	SEC	K4B1G0846E HCH9	SS	1GB
22	Samsung	M378B5673EH1-CH9	SEC	K4B1G0846E HCH9	DS	2GB
23	Silicon Powe	SP001GBLTU133S01	Nanya	NT5CB128M8AN-CG	SS	1GB
24	Silicon Powe	SP002GBLTU133S01	Nanya	NT5CB128M8AN-CG	DS	2GB
25	Unifosa	GU502203EP0201	Elpida	J1108BDBG-DJ-F	SS	1GB
26	Unifosa	GU512303EP0202	Elpida	J1108BDBG-DJ-F	DS	2GB
27	Ramaxel	RMR1810E7F-1333	Elpida	J1108BDBG-DJ-F	SS	1GB
28	Elpida	EBJ10UE8BDF0-DJ-F	Elpida	J1108BDSE-DJ-F	SS	1GB
29	Elpida	EBJ21UE8BDF0-DJ-F	Elpida	J1108BDSE-DJ-F	DS	2GB
30	A-data	游戲威龍8-8-8-24			DS	2GB
31	Hynix	HMT351U6BFR8C-H9	Hynix	H5TQ2G83BFR	DS	4GB
32	Hynix	HMT351U6BFR8C-H9	Hynix	H5TQ2G83BFR	SS	2GB
33	Micron	MT8JTF25664AZ-1G4D1	Micron	0BD12 D9LCK	SS	2GB
34	Micron	MT16JTF51264AZ-1G4D1	Micron	0FD12 D9LCK	DS	4GB

DDR3 1600

NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	A-DATA	極速飛龍			DS	2GB
2	Elixir	M2Y2G64CB8HA9N-DG			DS	2GB
3	Elixir	M2Y2G64CB8H5N-DG	Elixir	N2CB1G80AN-DG	DS	2GB
4	G.SKILL	F3-12800CL9D-4GBNQ			DS	2GB
5	G.SKILL	F3-12800CL9D-4GBECO 1.35V			DS	2GB
6	G.SKILL	F3-12800CL7D-4GBECO 1.35V			DS	2GB
7	G.SKILL	F3-12800CL9D-4GBRL			DS	2GB
8	Apacer	78.AAGD0.9KD			DS	2GB
9	KingMax	FLGD45F-B8KG9 NEES	KingMax	KFB8FNGXF-ANX-12A	SS	1GB
10	KingMax	FLGE85F-B8KG9 NEES	KingMax	KFB8FNGXF-ANX-12A	DS	2GB

DDR3 1800

NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Corsair	TR3X6G1866C9D			DS	2GB
2	Kingston	KHX1800C9D3K3/3GX			SS	1GB

DDR3 2000

NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Apacer	78.AAGD5.9KD			DS	2GB

DDR3 2133

NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	Kingston	KHX2133C9D3T 1K2/4GX			DS	2GB

DDR3 2200

NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	KingMax	FLKE85F-B8KJA FEIH			DS	2GB
2	G.SKILL	F3-17600CL7D-4GBPIS			DS	2GB

DDR3 2400

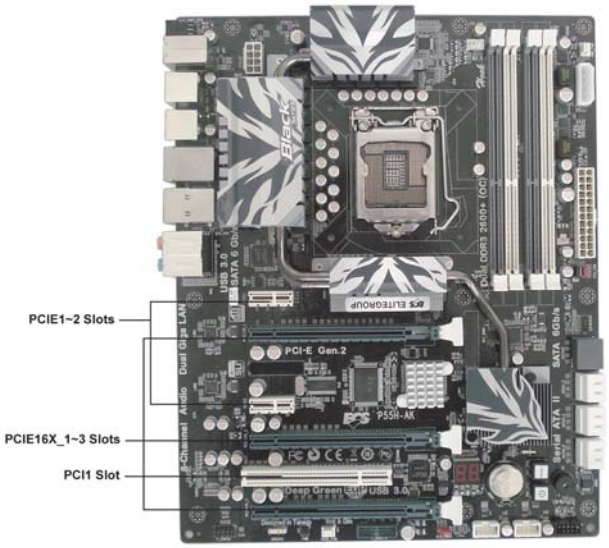
NO.	Vendor	Module part number	IC Brand	IC Chip Number	SS/DS	Size
1	G.SKILL	F3-19200CL9D-4GBPIS			DS	2GB

It is recommended to use Intel® *XMP momory modules with intel Lynnfield CPU.*

Expansion Slots

Installing Add-on Cards

The slots on this motherboard are designed to hold expansion cards and connect them to the system bus. Expansion slots are a means of adding or enhancing the motherboard's features and capabilities. With these efficient facilities, you can increase the motherboard's capabilities by adding hardware that performs tasks that are not part of the basic system.



PCI1 Slot This motherboard is equipped with one standard PCI slot. PCI stands for Peripheral Component Interconnect and is a bus standard for expansion cards, which for the most part, is a supplement of the older ISA bus standard. The PCI slot on this board are PCI v2.3 compliant.

PCIEX16_1~3 Slots The PCI Express x16 slots are used to install an external PCI Express graphics card that is fully compliant to the PCI Express Base Specification revision 2.0. For CrossFireX™ information please refer to Chapter 5.

PCIE1~2 Slots The PCI Express x1 slots are fully compliant to the PCI Express Base Specification revision 1.1.

Before installing an add-on card, check the documentation for the card carefully. If the card is not Plug and Play, you may have to manually configure the card before installation.

Follow these instructions to install an add-on card:

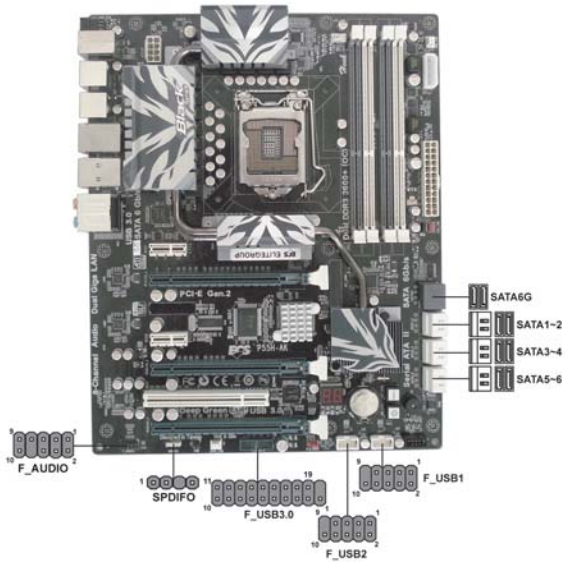
1 Remove a blanking plate from the system case corresponding to the slot you are going to use.
2 Install the edge connector of the add-on card into the expansion slot. Ensure that the edge connector is correctly seated in the slot.
3 Secure the metal bracket of the card to the system case with a screw.

1. For some add-on cards, for example graphics adapters and network adapters, you have to install drivers and software before you can begin using the add-on card.

2. The onboard PCI interface does not support 64-bit SCSI cards.

Connecting Optional Devices

Refer to the following for information on connecting the motherboard's optional devices:



F_AUDIO: Front Panel Audio header

This header allows the user to install auxiliary front-oriented microphone and line-out ports for easier access.

Pin	Signal Name	Pin	Signal Name
1	PORT 1L	2	AUD_GND
3	PORT 1R	4	PRESENCE#
5	PORT 2R	6	SENSE1_RETURN
7	SENSE_SEND	8	KEY
9	PORT 2L	10	SENSE2_RETURN

SATA1~6: Serial ATAII connectors

These connectors are used to support the Serial ATA 3Gb/s devices, simpler disk drive cabling and easier PC assembly. It eliminates limitations of the current Parallel ATA interface. But maintains register compatibility and software compatibility with Parallel ATA.

Pin	Signal Name	Pin	Signal Name
1	Ground	2	TX+
3	TX-	4	Ground
5	RX-	6	RX+
7	Ground	-	-

SATA6G: Serial ATAIII connectors

These connectors are used to support the Serial ATA devices for the highest data transfer rates (6.0 Gb/s), simpler disk drive cabling and easier PC assembly. It doubles the transfer rate of current SATA 3.0Gb/s interface.

Pin	Signal Name	Pin	Signal Name
1	Ground	2	TX+
3	TX-	4	Ground
5	RX-	6	RX+
7	Ground	-	-

F_USB1~2 (USB 2.0): Front Panel USB 2.0 headers.

The motherboard has two USB 2.0 headers supporting 4 USB 2.0 ports. Additionally, some computer cases have USB 2.0 ports at the front of the case. If you have this kind of case, use auxiliary USB 2.0 connector to connect the front-mounted ports to the motherboard.

Pin	Signal Name	Function
1	USBPWR	Front Panel USB Power
2	USBPWR	Front Panel USB Power
3	USB_FP_P0-	USB Port 0 Negative Signal
4	USB_FP_P1-	USB Port 1 Negative Signal
5	USB_FP_P0+	USB Port 0 Positive Signal
6	USB_FP_P1+	USB Port 1 Positive Signal
7	GND	Ground
8	GND	Ground
9	Key	No pin
10	USB_FP_OC0	USBOC-

F_USB3.0: Front Panel USB 3.0 headers.

This Motherboard implements one USB 3.0 header supporting 2 extra front USB 3.0 ports, which delivers 5Gb/s transfer rate.

Pin	Signal Name	Function
1	Vbus	Front Panel USB Power
2	IntA_P1_SSRX-	USB3 ICC Port1 SuperSpeed Rx-
3	IntA_P2_SSRX+	USB3 ICC Port1 SuperSpeed Rx+
4	GND	GND
5	IntA_P1_SSTX-	USB3 ICC Port1 SuperSpeed Tx-
6	IntA_P1_SSTX+	USB3 ICC Port1 SuperSpeed Tx+
7	GND	GND
8	IntA_P1_D-	USB3 ICC Port1 D-
9	IntA_P1_D+	USB3 ICC Port1 D+
10	ID USBOC-	Over Current Protection
11	IntA_P2_D+	USB3 ICC Port2 D+
12	IntA_P2_D-	USB3 ICC Port2 D-
13	GND	GND

Pin	Signal Name	Function
14	IntA_P2_SSTX+	USB3 ICC Port2 SuperSpeed Tx+
15	IntA_P2_SSTX-	USB3 ICC Port2 SuperSpeed Tx-
16	GND	GND
17	IntA_P2_SSRX+	USB3 ICC Port2 SuperSpeed Rx+
18	IntA_P2_SSRX-	USB3 ICC Port2 SuperSpeed Rx-
19	Vbus	Front Panel USB Power

Please make sure that the USB cable has the same pin assignment as indicated above. A different pin assignment may cause damage or system hang-up.

SPDIFO: SPDIF out header

This is an optional header that provides an SPDIFO (Sony/Philips Digital Interface) output to digital multimedia device through optical fiber or coaxial connector.

Pin	Signal Name
1	SPDIFOUT
2	+5V
3	Key
4	GND

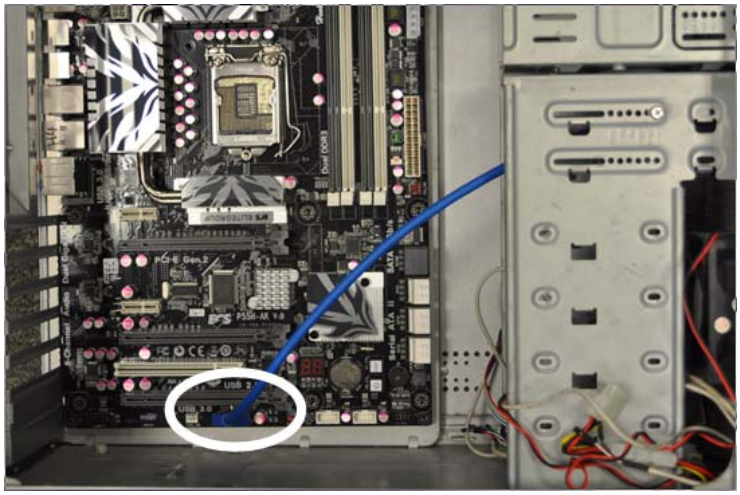
Installation of Front USB 3.0 Panel

ECS exclusive USB3.0 front panel is a 3.5-inch USB shield that combines with the latest USB3.0 cable, which provides 2 extra USB3.0 ports for users to have the fastest and easy-to-reach USB interface. It matches the size of standard FDD to fit in standard chassis design.

Step1. Remove the 3.5 inch blanking plate and locate it with USB 3.0 panel at the front of the chassis.

Step2. Find proper screw holes in the case to install USB3.0 panel:

Step3. Connect cable with the on-board USB3.0 header



Installing SATA Hard Drives

This section describes how to install IDE devices such as a hard disk drive and a CD-ROM drive.

About SATA Connectors

Your motherboard features six SATA 3.0 Gb/s connectors and two SATA 6.0Gb/s connectors supporting a total of eight drives SATA refers to Serial ATA (Advanced Technology Attachment) is the standard interface for the IDE hard drives which are currently used in most PCs. These connectors are well designed and will only fit in one orientation. Locate the SATA connectors on the motherboard and follow the illustration below to install the SATA hard drives.

Installing Serial ATA Hard Drives

To install the Serial ATA (SATA) hard drives, use the SATA cable that supports the Serial ATA protocol. You can connect either end of the SATA cable to the SATA hard drive or the connector on the motherboard.

SATA cable (optional)

SATA power cable (optional)

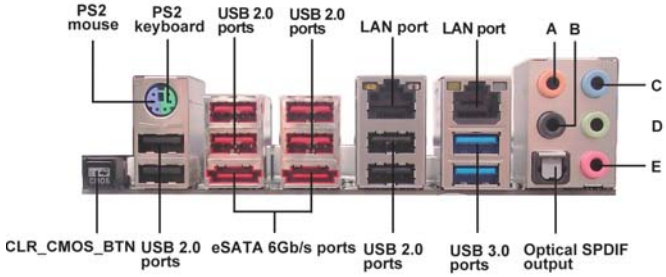
Refer to the illustration below for proper installation:

1 Attach either cable end to the connector on the motherboard.
2 Attach the other cable end to the SATA hard drive.
3 Attach the SATA power cable to the SATA hard drive and connect the other end to the power supply.

This motherboard supports the "Hot-Plug" function.

Connecting I/O Devices

The backplane of the motherboard has the following I/O ports:



PS/2 Keyboard/Mouse Combo Port Connect the PS/2 Keyboard or PS/2 Mouse to the PS/2 combo port.

CLR_CMOS Button Use the CLR_CMOS button to clear CMOS.

Before clearing CMOS, make sure to turn off the power of the system.

eSATA 6Gb/s port Use this port to connect to external SATA boxes or Serial ATA port multipliers.

LAN Ports Connect an RJ-45 jack to the LAN port to connect your computer to the Network.

USB 2.0 Ports Use the USB 2.0 ports to connect USB 2.0 devices.

USB 3.0 Ports Use the USB 3.0 ports to connect USB 3.0 devices.

Optical SPDIF Output This jack connects to external optical digital audio output devices.

Audio Ports Use the audio jacks to connect audio devices. The C port is for stereo line-in signal, while the E port is for microphone in signal. This motherboard supports audio devices that correspond to the A, B, and D port respectively. In addition, both of the 2 ports, B, and D provide users with both right & left channels individually. Users please refer to the following note for specific port function definition.

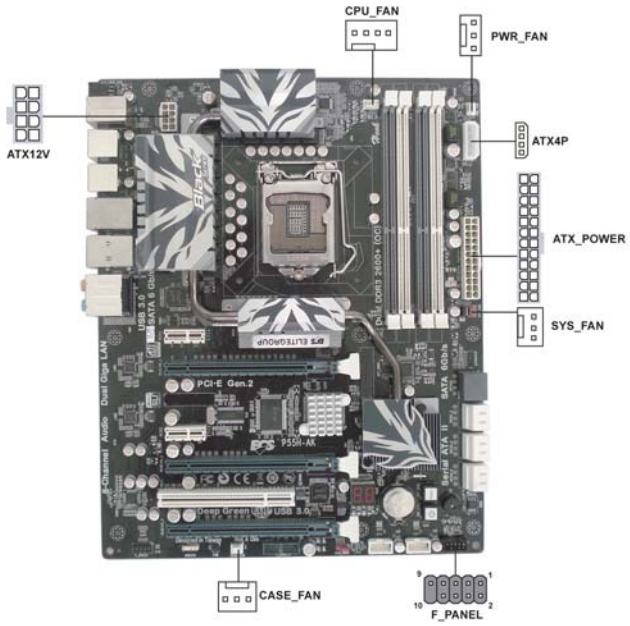
A: Center & Woofer	D: Front Out
B: Back Surround	E: Mic_in Rear
C: Line-in	-

The above port definition can be changed to audio input or audio output by changing the driver utility setting.

Connecting Case Components

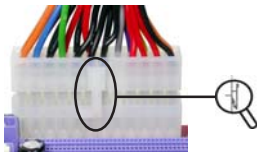
After you have installed the motherboard into a case, you can begin connecting the motherboard components. Refer to the following:

1 Connect the CPU cooling fan cable to **CPU_FAN**.
2 Connect the system cooling fan connector to **SYS_FAN**.
3 Connect the case cooling fan connector to **CASE_FAN**.
4 Connect the power cooling fan connector to **PWR_FAN**.
5 Connect the case switches and indicator LEDs to the **F_PANEL**.
6 Connect the standard power supply connector to **ATX_POWER**.
7 Connect the connector for graphics interface to **ATX4P**.
8 Connect the auxiliary case power supply connector to **ATX12V**.



1. Connecting 24-pin power cable

The ATX 24-pin connector allows you to connect to ATX v2.x power supply.

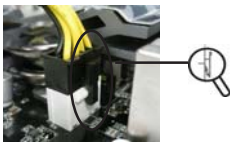


24-pin power cable

With ATX v2.x power supply, users please note that when installing 24-pin power cable, the latches of power cable and the ATX_POWER match perfectly.

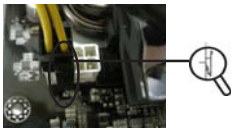
2. Connecting 8/4-pin power cable

Users please note that the 8-pin and 4-pin power cables can both be connected to the ATX12V connector.



8-pin power cable

When installing 8-pin power cable, the latches of power cable and the ATX12V connector match perfectly.



4-pin power cable

When installing 4-pin power cable, the latch falls on the left side of the ATX12V connector.

CPU_FAN: CPU cooling FAN Power Connector

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor
4	PWM	PWM

Users please note that the fan connector supports the CPU cooling fan of 1.1A ~ 2.2A (26.4W max) at +12V.

CASE_FAN/SYS_FAN: FAN Power Connectors

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor

ATX_ POWER: ATX 24-pin Power Connector

Pin	Signal Name	Pin	Signal Name
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	Ground	15	Ground
4	+5V	16	PS_ON
5	Ground	17	Ground
6	+5V	18	Ground
7	Ground	19	Ground
8	PWRGD	20	-5V
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Ground

PWR_FAN: FAN Power Connector

Pin	Signal Name	Function
1	GND	System Ground
2	+12V	Power +12V
3	Sense	Sensor

ATX12V: ATX 12V Power Connector

Pin	Signal Name	Pin	Signal Name
1	Ground	5	+12V
2	Ground	6	+12V
3	Ground	7	+12V
4	Ground	8	+12V

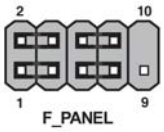
ATX4P: Auxiliary Power Connector for Graphics Interface

Pin	Signal Name
1	NC
2	GND
3	GND
4	+12V

Make sure to connect a 4-pin ATX power cable to ATX4P; otherwise, the system will be unstable.

Front Panel Header

The front panel header (F_PANEL) provides a standard set of switch and LED headers commonly found on ATX or Micro ATX cases. Refer to the table below for information:



Pin	Signal	Function	Pin	Signal	Function
1	HD_LED_P	Hard disk LED(+)	2	FP PWR/SLP	*MSG LED(+)
3	HD_LED_N	Hard disk LED(-)	4	FP PWR/SLP	*MSG LED(-)
5	RST_SW_N	Reset Switch(-)	6	PWR_SW_P	Power Switch(+)
7	RST_SW_P	Reset Switch(+)	8	PWR_SW_N	Power Switch(-)
9	RSVD	Reserved	10	Key	No pin

** MSG LED (dual color or single color)*

Users please note that the above picture is for reference only, you should determine the header pin definition by the actual key pin location.

Hard Drive Activity LED

Connecting pins 1 and 3 to a front panel mounted LED provides visual indication that data is being read from or written to the hard drive. For the LED to function properly, an IDE drive should be connected to the onboard IDE interface. The LED will also show activity for devices connected to the SCSI (hard drive activity LED) connector.

Power/Sleep/Message waiting LED

Connecting pins 2 and 4 to a single or dual-color, front panel mounted LED provides power on/off, sleep, and message waiting indication.

Reset Switch

Supporting the reset function requires connecting pin 5 and 7 to a momentary-contact switch that is normally open. When the switch is closed, the board resets and runs POST.

Power Switch

Supporting the power on/off function requires connecting pins 6 and 8 to a momentary-contact switch that is normally open. The switch should maintain contact for at least 50 ms to signal the power supply to switch on or off. The time requirement is due to internal de-bounce circuitry. After receiving a power on/off signal, at least two seconds elapses before the power supply recognizes another on/off signal.

This concludes Chapter 2. The next chapter covers the BIOS.

Chapter 3
Using BIOS

About the Setup Utility

The computer uses the latest "American Megatrends Inc. " BIOS with support for Windows Plug and Play. The CMOS chip on the motherboard contains the ROM setup instructions for configuring the motherboard BIOS.

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides you with options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information when the power is turned off. When the system is turned back on, the system is configured with the values you stored in CMOS.

The BIOS Setup Utility enables you to configure:

- Hard drives, diskette drives and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power Management features

The settings made in the Setup Utility affect how the computer performs. Before using the Setup Utility, ensure that you understand the Setup Utility options.

This chapter provides explanations for Setup Utility options.

The Standard Configuration

A standard configuration has already been set in the Setup Utility. However, we recommend that you read this chapter in case you need to make any changes in the future.

This Setup Utility should be used:

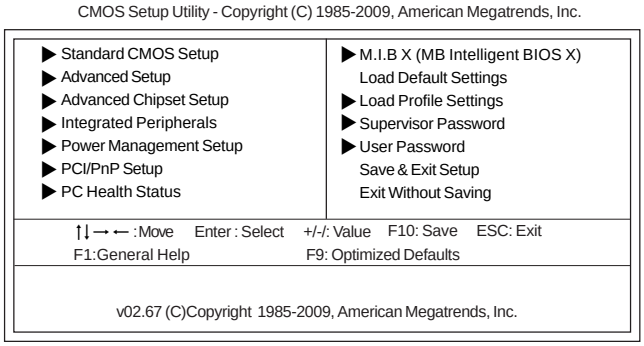
- when changing the system configuration
- when a configuration error is detected and you are prompted to make changes to the Setup Utility
- when trying to resolve IRQ conflicts
- when making changes to the Power Management configuration
- when changing the password or making other changes to the Security Setup

Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears:

Press DEL to enter SETUP

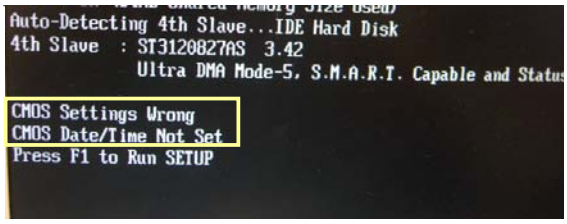
Press the delete key to access the BIOS Setup Utility.

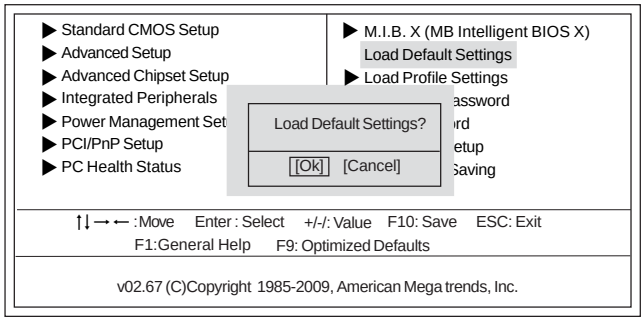


Resetting the Default CMOS Values

When powering on for the first time, the POST screen may show a "CMOS Settings Wrong" message. This standard message will appear following a clear CMOS data at factory by the manufacturer. You simply need to Load Default Settings to reset the default CMOS values.

Note: Changes to system hardware such as different CPU, memories, etc. may also trigger this message.





Using BIOS

When you start the Setup Utility, the main menu appears. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ▶) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

In this manual, default values are enclosed in parenthesis. Submenu items are denoted by a triangle ▶.

The default BIOS setting for this motherboard apply for most conditions with optimum performance. We do not suggest users change the default values in the BIOS setup and take no responsibility to any damage caused by changing the BIOS settings.

BIOS Navigation Keys

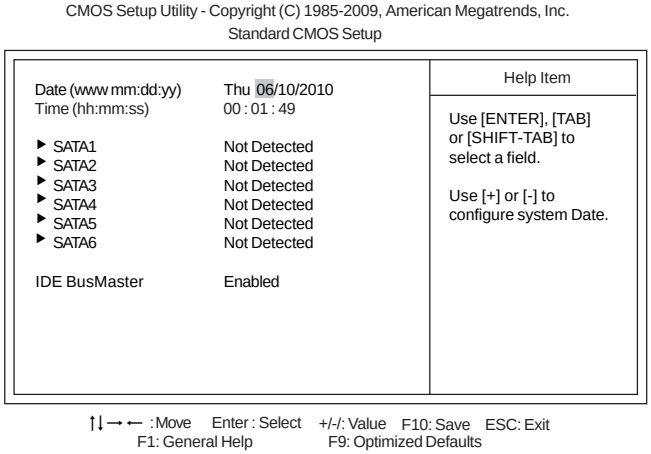
The BIOS navigation keys are listed below:

KEY	FUNCTION
ESC	Exits the current menu
↑↓→←	Scrolls through the items on a menu
+/-/	Modifies the selected field's values
Enter	Select
F9	Loads an optimized setting for better performance
F10	Saves the current configuration and exits setup
F1	Displays a screen that describes all key functions

For the purpose of better product maintenance, we reserve the right to change the BIOS items presented in the manual. The BIOS setup screens shown in this chapter are for reference only. Please visit our website for updated manual.

Standard CMOS Setup

This option displays basic information about your system.

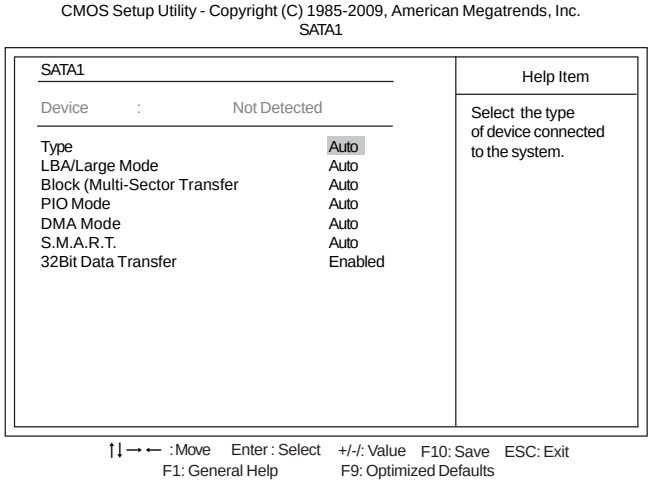


Date & Time

The Date and Time items show the current date and time on the computer. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date and Time Properties utility.

► **SATA1~6**

This motherboard supports six SATA channels and each channel allows one SATA device to be installed. Use these items to configure each device on the SATA channel.



Type (Auto)

Use this item to configure the type of the IDE device that you specify. If the feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

LBA/Large Mode (Auto)

Use this item to set the LBA/Large mode to enhance hard disk performance by optimizing the area the hard disk is visited each time.

Block (Multi-Sector Transfer) (Auto)

If the feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

PIO Mode (Auto)

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

DMA Mode (Auto)

DMA capability allows users to improve the transfer-speed and data-integrity for compatible IDE devices.

S.M.A.R.T. (Auto)

The S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system is a diagnostics technology that monitors and predicts device performance. S.M.A.R.T. software resides on both the disk drive and the host computer.

32Bit Data Transfer (Enabled)

Use this item to enable or disable 32Bit Data Transfer.

Press <Esc> to return to the Standard CMOS Setup page.

IDE BusMaster (Enabled)

This item enables or disables the DMA under DOS mode. We recommend you to leave this item at the default value.

Press <Esc> to return to the main menu setting page.

Advanced Setup

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.

CMOS Setup Utility - Copyright (C) 1985-2009, American Megatrends, Inc.
Advanced Setup

		Help Item
Thermal Management	Enabled	
TM Status	TM1/TM2	CPU Thermal Monitor.
Limit CPUID MaxVal	Disabled	
Enhanced Halt (C1E)	Enabled	
Intel XD Bit	Disabled	
Intel VT	Enabled	
Intel EIST	Enabled	
Intel (R) HT Technology	Enabled	
Intel (R) TurboMode tech	Enabled	
Turbo Ratio Limit Program	Enabled	
1-Core Ratio Limit	26	
2-Core Ratio Limit	25	
3-Core Ratio Limit	0	
4-Core Ratio Limit	0	
TDC Limit Override	Enabled	
TDC Limit Value	472	
TDP Limit Override	Enabled	
TDP Limit Value	584	
Quick Power on Self Test	Enabled	
Boot Up Numlock Status	On	
APIC Mode	Enabled	
1st Boot Device	Hard Drive	
2nd Boot Device	CD/DVD	
3rd Boot Device	Removable Dev.	
Boot Other Device	Yes	
ECS eJIFFY Function	Disabled	

↑↓→←: Move Enter : Select +/-/: Value F10: Save ESC: Exit
F1: General Help F9: Optimized Defaults

Thermal Management (Enabled)

This item displays CPU's temperature and enables you to set a safe temperature to Prescott CPU.

TM Status (TM1/TM2)

This item shows TM function status if CPU can support TM function.

Limit CPUID MaxVal (Disabled)

Use this item to enable or disable the Max CPU ID value limit. When supports Prescott and LGA775 CPUs, enables this to prevent the system from "rebooting" when trying to install Windows NT 4.0.

Enhanced Halt (C1E) (Enabled)

This item enables or disables enhanced halt (C1E).

Intel XD Bit (Disabled)

This item allows users to enable or disable the Intel XD bit.

Intel VT (Enabled)

When enabled, a VMM can utilize the additional hardware capabilities provided by Vandor Poor Technology.

Intel EIST (Enabled)

This item allows users to enable or disable the EIST (Enhanced Intel SpeedStep technology).

Intel (R) HT Technology (Enabled)

This item enables or disables Intel HT technology support.

Intel (R) TurboMode tech (Enabled)

This item enables or disables Intel TurboMode Technology support.

1~4-Core Ratio Limit (25/25/0/0)

This item set all core ratio limit value.

TDC Limit Override (Enabled)

This item enables or disables TDC limit override.

TDC Limit Value (472)

This item set TDC limit value.

TDP Limit Override (Enabled)

This item enables or disables TDP limit override.

TDP Limit Value (584)

This item set TDP limit value.

Quick Power on Self Test (Enabled)

Enable this item to shorten the power on testing (POST) and have your system start up faster. You might like to enable this item after you are confident that your system hardware is operating smoothly.

Boot Up Numlock Status (On)

This item defines if the keyboard Num Lock key is active when your system is started.

APIC Mode (Enabled)

This item allows you to enable or disable the APIC (Advanced Programmable Interrupt Controller) mode. APIC provides symmetric multi-processing (SMP) for systems, allowing support for up to 60 processors.

1st/2nd/3rd Boot Device (Hard Drive/CD/DVD/Removable Dev.)

Use this item to determine the device order the computer used to look for an operating system to load at start-up time. The devices showed here will be different depending on the exact devices installed on your motherboard.

Boot Other Device (Yes)

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the First, Second and Third boot devices.

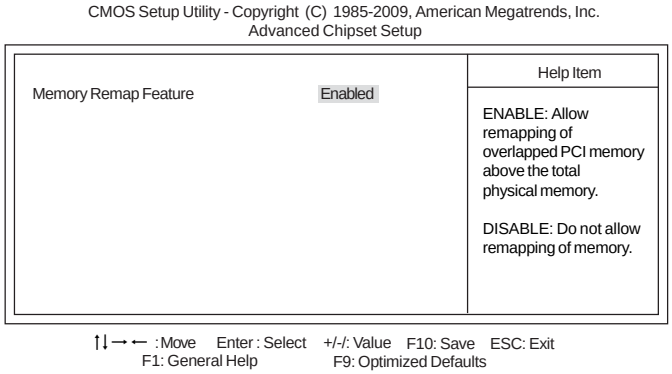
ECS eJIFFY Function (Disabled)

Use this item to enable or disable the ECS eJIFFY Function. eJIFFY is ECS unique software program for the quick access to the internet without entering O.S. Please refer to Chapter 5 to know more about eJIFFY.

Press <Esc> to return to the main menu setting page.

Advanced Chipset Setup

This page sets up more advanced information about your system. Handle this page with caution. Any changes can affect the operation of your computer.



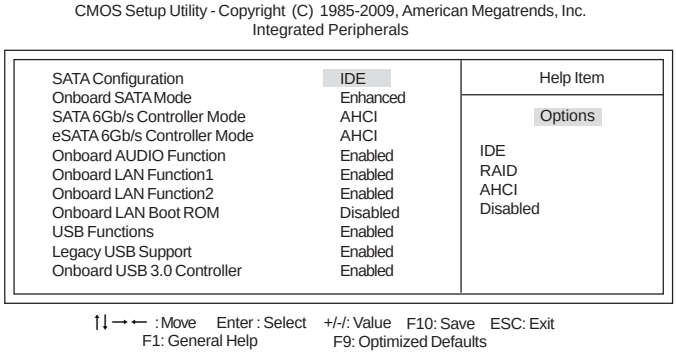
Memory Remap Feature (Enabled)

This item allows you to remap the overlapped PCI memory above the total physical memory if you have a 64 bit OS and 8 GB of RAM.

Press <Esc> to return to the main menu setting page.

Integrated Peripherals

This page sets up some parameters for peripheral devices connected to the system.



SATA Configuration (IDE)

Use this item to show the Serial ATA Configuration.

Onboard SATA Mode (Enhanced)

Use this item to select the mode of the Serial ATA.

SATA 6Gb/s Controller Mode (AHCI)

Use this item to choose SATA 6Gb/s controller mode.

eSATA 6Gb/s Controller Mode (AHCI)

Use this item to choose eSATA 6Gb/s controller mode.

Onboard AUDIO Function (Enabled)

Use this item to enable or disable the onboard audio device.

Onboard LAN Function1~2 (Enabled)

Use this item to enable or disable the onboard LAN1~2 function.

Onboard LAN Boot ROM (Disabled)

Use this item to enable or disable the booting from the onboard LAN or a network add-in card with a remote boot ROM installed.

USB Functions (Enabled)

Use this item to enable or disable the USB function.

Legacy USB Support (Enabled)

Use this item to enable or disable support for legacy USB device.

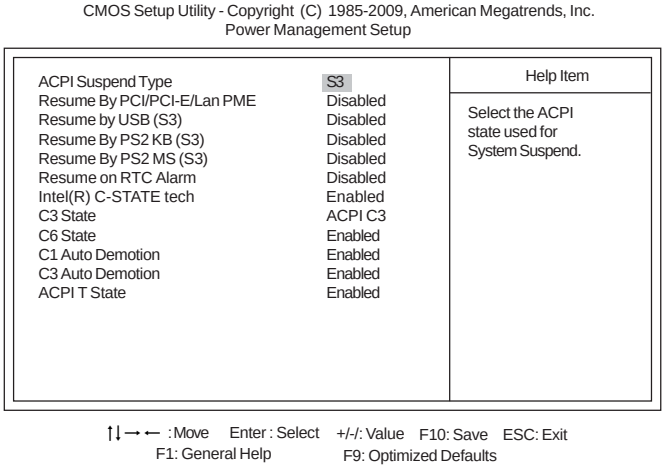
Onboard USB 3.0 Controller (Enabled)

Use this item to enable or disable onboard USB 3.0 controller.

Press <Esc> to return to the main menu setting page.

Power Management Setup

This page sets up some parameters for system power management operation.



ACPI Suspend Type (S3)

Use this item to define how your system suspends. In the default, S3, the suspend mode is a suspend to RAM, i.e, the system shuts down with the exception of a refresh current to the system memory.

Resume By PCI/PCI-E/Lan PME (Disabled)

These items specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

Resume by USB (S3) (Disabled)

This item allows you to enable/disable the USB device wakeup function from S3/S4 mode.

Resume By PS2 KB (S3) (Disabled)

This item enables or disables you to allow keyboard activity to awaken the system from power saving mode.

Resume By PS2 MS (S3) (Disabled)

This item enables or disables you to allow mouse activity to awaken the system from power saving mode.

Resume on RTC Alarm (Disabled)

The system can be turned off with a software command. If you enable this item, the system can automatically resume at a fixed time based on the system RTC (realtime clock). Use the items below this one to set the date and time of the wake-up alarm. You must use an ATX power supply in order to use this feature.

Intel(R) C-STATE tech (Enabled)

This item allows you to enable or disable Intel (R) C-STATE technology (C-STATE: cpu idle is set to C2/C3/C4).

C3/6State (ACPI C3)

Nehalem C state action select.

C1/3 Auto Demotion (Enabled)

This item allows you to enable or disable C1/3 auto demotion.

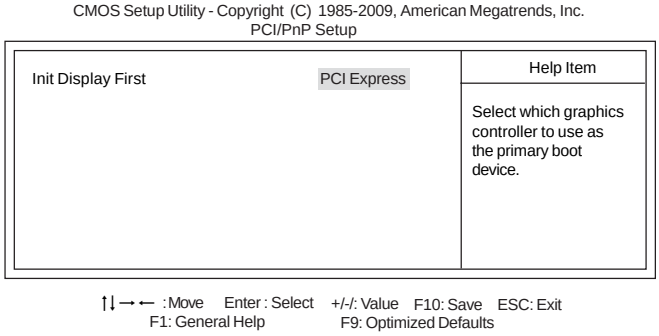
ACPI T State (Enabled)

This item allows you to enable or disable ACPI T state.

Press <Esc> to return to the main menu setting page.

PCI/PnP Setup

This page sets up some parameters for devices installed on the PCI bus and those utilizing the system plug and play capability.



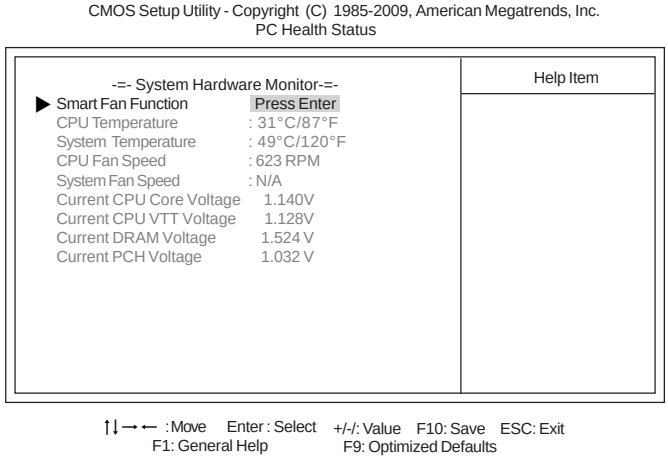
Init Display First (PCI Express)

Use this item to select which graphics controller to use as the primary boot devices.

Press <Esc> to return to the main menu setting page.

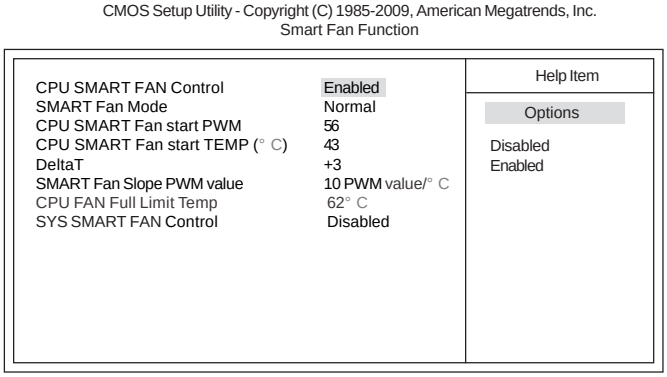
PC Health Status

On motherboards support hardware monitoring, this item lets you monitor the parameters for critical voltages, temperatures and fan speeds.



▶Smart Fan Function (Press Enter)

Scroll to this item and press <Enter> to view the following screen:

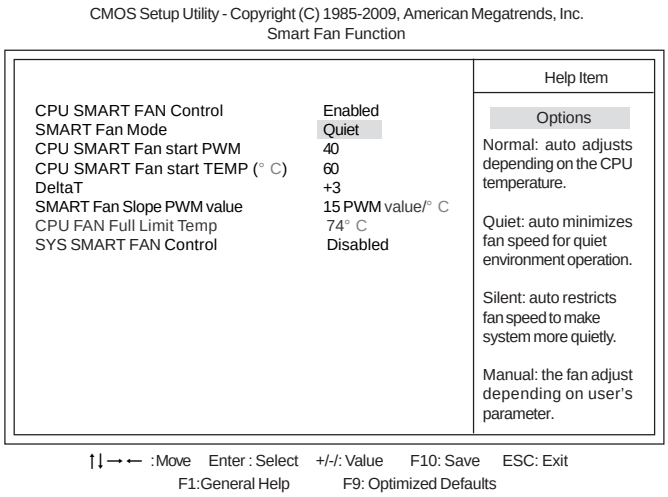


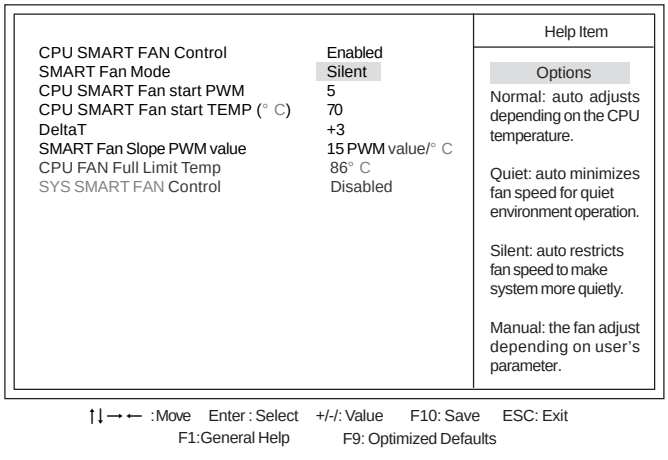
CPU SMART FAN Control (Enabled)

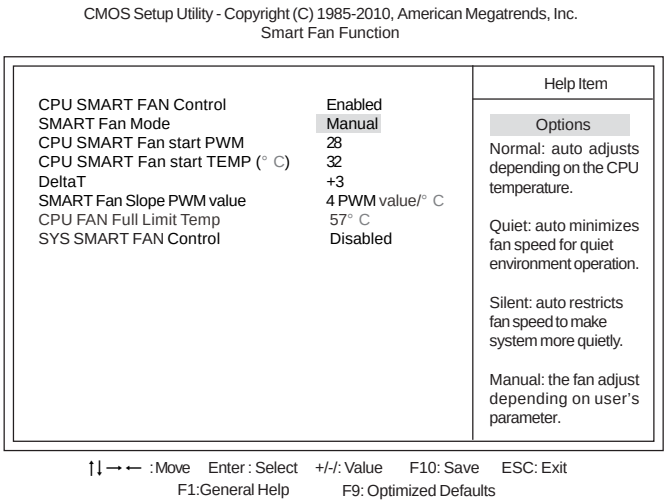
This item allows you to enable/disable the control of the CPU fan speed by changing the fan voltage.

SMART Fan Mode (Normal)

This item allows you to select the fan mode (Normal, Quiet, Silent, or Manual) for a better operation environment. If you choose Normal mode, the fan speed will be auto adjusted depending on the CPU temperature. If you choose Quite mode, the fan speed will be auto minimized for quiet environment. If you choose Silent mode, the fan speed will be auto restricted to make system more quietly. If you choose Manual mode, the fan speed will be adjust depending on users' parameters.







CPU SMART Fan start PWM (56)

This item allows you to enable or disable the control of the CPU fan speed by changing the fan voltage.

CPU SMART Fan start TEMP. (°C) (43)

This item is used to set the start temperature of the smart fan.

DeltaT (+3)

This item specifies the range that controls CPU temperature and keeps it from going so high or so low when smart fan works.

SMART Fan Slope PWM value (10 PWM value/°C)

This item is used to set the Slope Select PWM of the smart fan.

CPU FAN Full Limit Temp (62°C)

This item is used to set the Slope Select PWM of the smart fan.

SYS SMART FAN Control (Disabled)

This item allows you to enable or disable the control of the system fan speed by changing the fan voltage.

Press <Esc> to return to the PC Health Status page.

Shutdown Temperature (Disabled)

Enable you to set the maximum temperature the system can reach before powering down

System Component Characteristics

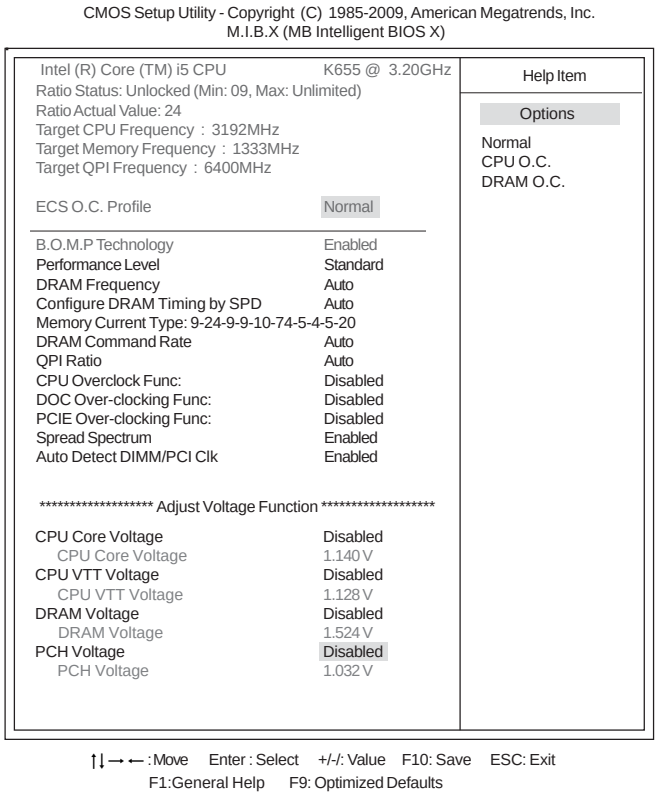
These items display the monitoring of the overall inboard hardware health events, such as System & CPU temperature, CPU & DIMM voltage, CPU & system fan speed,...etc.

- CPU Temperature
- System Temperature
- CPU Fan Speed
- System Fan Speed
- Current CPU Core Voltage
- Current CPU VTT Voltage
- Current DRAM Voltage
- Current PCH Voltage

Press <Esc> to return to the main menu setting page.

M.I.B. X (MB Intelligent Bios X)

This page enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.



Intel (R) Core (TM) i5 CPU K655 @ 3.20GHz

This is display-only field and displays the information of the CPU installed in your computer.

Ratio Status/Ratio Actual Value (Unlocked/24)

These items show the locked/unlocked ratio status and the actual ratio of the CPU installed in your system.

Target CPU Frequency (3192MHz)

This item displays the target CPU frequency.

Target memory Frequency (1333MHz)

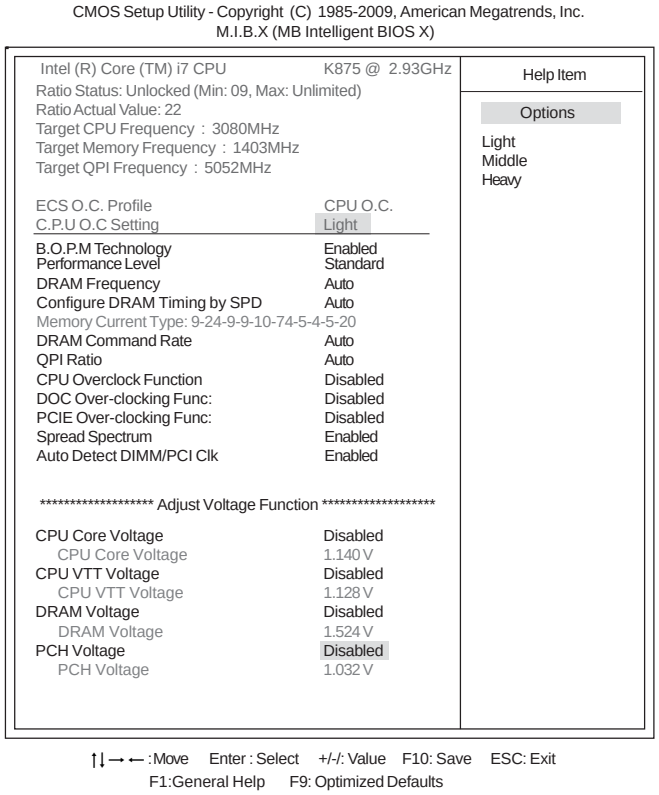
This item displays the target memory frequency.

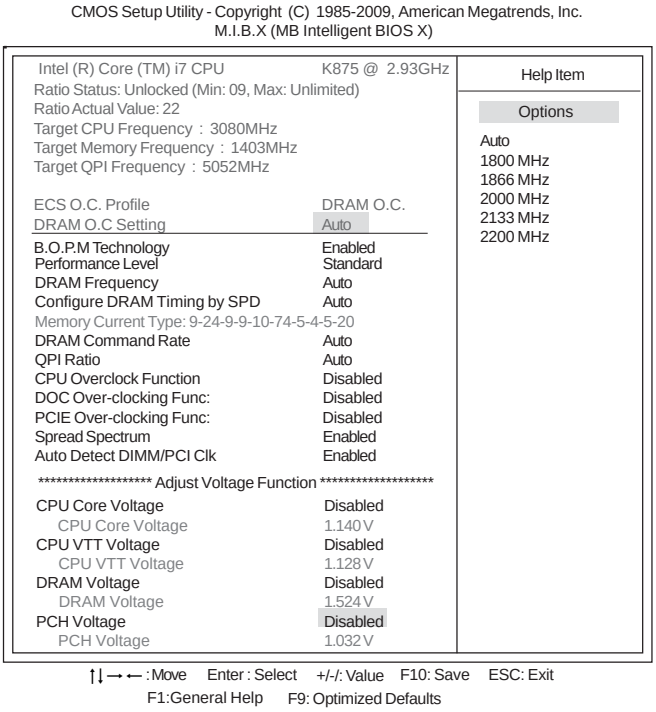
Target QPI Frequency (6400MHz)

This item displays the target QPI frequency.

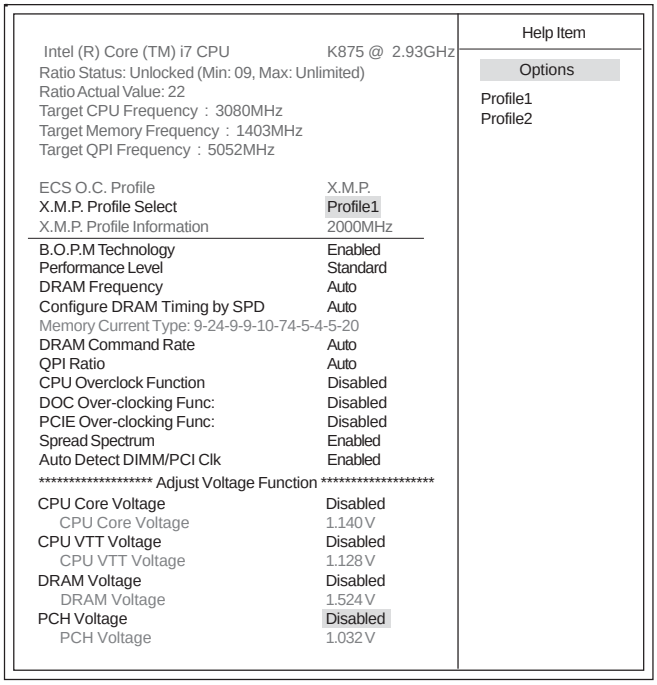
ECS O.C. Profile (Normal)

This item allows you to select the system mode (Normal, CPU O.C., DRAM O.C., or X.M.P.) for a better performance system. If you choose Normal mode, the system will be run default value; if you choose CPU O.C. mode, the system will be adjust BCLK to improve performance; if you choose DRAM O.C. mode, the system will be adjust memory frequency to improve performance; if you choose X.M.P. mode, the system will be run memory X.M.P. profile parameters.




CMOS Setup Utility - Copyright (C) 1985-2009, American Megatrends, Inc.
M.I.B.X (MB Intelligent BIOS X)
Intel (R) Core (TM) i7 CPU K875 @ 2.93GHz
Ratio Status: Unlocked (Min: 09, Max: Unlimited)
Ratio Actual Value: 22
Target CPU Frequency : 3080MHz
Target Memory Frequency : 1403MHz
Target QPI Frequency : 5052MHz
ECS O.C. Profile DRAM O.C.
DRAM O.C Setting Auto
B.O.P.M Technology Enabled
Performance Level Standard
DRAM Frequency Auto
Configure DRAM Timing by SPD Auto
Memory Current Type: 9-24-9-9-10-74-5-4-5-20
DRAM Command Rate Auto
QPI Ratio Auto
CPU Overclock Function Disabled
DOC Over-clocking Func: Disabled
PCIE Over-clocking Func: Disabled
Spread Spectrum Enabled
Auto Detect DIMM/PCI Clk Enabled
********** Adjust Voltage Function **********
CPU Core Voltage Disabled
CPU Core Voltage 1.140 V
CPU VTT Voltage Disabled
CPU VTT Voltage 1.128 V
DRAM Voltage Disabled
DRAM Voltage 1.524 V
PCH Voltage Disabled
PCH Voltage 1.032 V
Help Item
Options
Auto
1800 MHz
1866 MHz
2000 MHz
2133 MHz
2200 MHz
↑↓→←: Move Enter : Select +/-/: Value F10: Save ESC: Exit
F1:General Help F9: Optimized Defaults

CMOS Setup Utility - Copyright (C) 1985-2009, American Megatrends, Inc.
M.I.B.X (MB Intelligent BIOS X)



↑↓→←:Move Enter : Select +/-/: Value F10: Save ESC: Exit
F1:General Help F9: Optimized Defaults

B.O.M.P Technology (Enabled)
This item allows users to enable or disable B.O.M.P technology. This function can run safe setting to setup menu when system boot fail 3 time.

Performance Level (Standard)
This item shows the performance level of the components, the options are: Standard and Enhanced.

DRAM Frequency (Auto)
This item enables users to adjust the DRAM frequency. The default setting is auto and we recommend users leave the setting unchanged. Modify it at will may cause the system to be unstable.

Configure DRAM Timing by SPD (Auto)
When this item is set to enable, the DDR timing is configured using SPD. SPD (Serial Presence Detect) is located on the memory modules, BIOS reads information coded in SPD during system boot up.

Memory Current Type (9-24-9-9-10-74-5-4-5-20)
This item displays the current memory type.

DRAM Command Rate (Auto)
This item specifies the rate of the DRAM Command.

QPI Ratio (Auto)
This item set QPI ratio.

CPU Over Clock Func (Disabled)
This item decides the CPU over-clocking function installed in your system. If the over-clocking fails, please turn off the system power. And then, hold the PageUp key (similar to the Clear CMOS function) and turn on the power, the BIOS will recover the safe default.

DOC Over-clocking Func. (Disabled)
This item enables or disables the DOC over-clocking function.

PCIE Over-clocking Func. (Disabled)
This item enables or disables the PCIE over-clocking function.

Spread Spectrum (Enabled)
If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system.

Auto Detect DIMM/PCI Clk (Enabled)
When this item is enabled, BIOS will disable the clock signal of free DIMM/PCI slots.

Adjust Voltage Function
Users can increase the hardware voltage through BIOS settings.

CPU Core Voltage
This item can adjust the CPU core voltage.

CPU VTT Voltage
This item can adjust the CPU VTT voltage.

DRAM Voltage
This item can adjust the DRAM voltage.

PCH Voltage

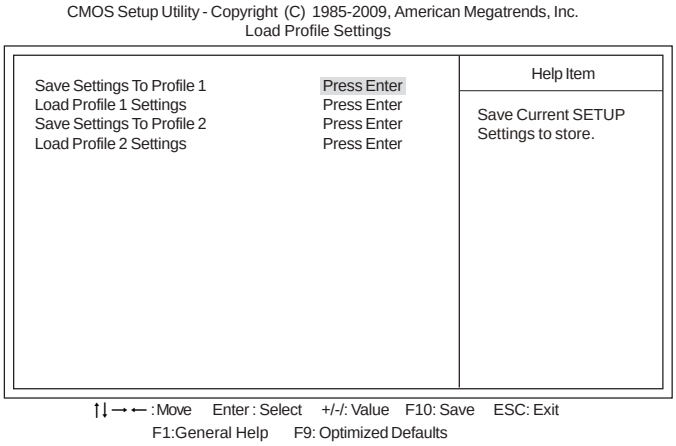
This item can adjust the PCH voltage.

Press <Esc> to return to the main menu setting page.

Load Default Settings

This option opens a dialog box that lets you install stability-oriented defaults for all appropriate items in the Setup Utility. Select <OK> and then press <Enter> to install the defaults. Select <Cancel> and then press <Enter> to not install the defaults.

Load Profile Settings



Save Settings To Profile 1~2 (Press Enter)

Press enter to save settings to profile 1~2.

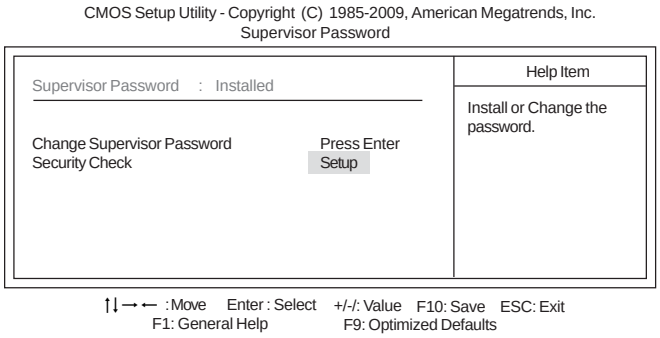
Load Profile 1~2 Settings (Press Enter)

Press enter to load profil 1~2 settins.

Press <Esc> to return to the main menu setting page.

Supervisor Password

This page helps you install or change a password.



Supervisor Password (Not Installed)

This item indicates whether a supervisor password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

Change Supervisor Password (Press Enter)

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

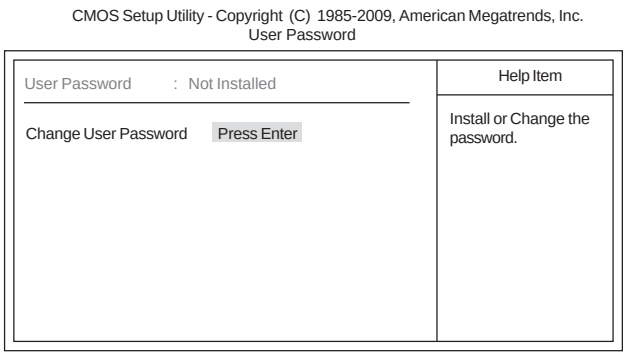
Security Check (Setup)

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

Press <Esc> to return to the main menu setting page.

User Password

This page helps you install or change a password.



User Password (Not Installed)

This item indicates whether a user password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

Change User Password (Press Enter)

You can select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

Press <Esc> to return to the main menu setting page.

Save & Exit Setup

Highlight this item and press <Enter> to save the changes that you have made in the Setup Utility and exit the Setup Utility. When the Save and Exit dialog box appears, select [OK] to save and exit, or select [Cancel] to return to the main menu.

Exit Without Saving

Highlight this item and press <Enter> to discard any changes that you have made in the Setup Utility and exit the Setup Utility. When the Exit Without Saving dialog box appears, select [OK] to discard changes and exit, or select [Cancel] to return to the main menu.

If you have made settings that you do not want to save, use the "Exit Without Saving*" item and select [OK] to discard any changes you have made.*

Updating the BIOS

You can download and install updated BIOS for this motherboard from the manufacturer's Web site. New BIOS provides support for new peripherals, improvements in performance, or fixes for known bugs. Install new BIOS as follows:

1. If your motherboard has a BIOS protection jumper, change the setting to allow BIOS flashing.
2. If your motherboard has an item called Firmware Write Protect in Advanced BIOS features, disable it. (Firmware Write Protect prevents BIOS from being overwritten.)
3. Prepare a bootable device or create a bootable system disk. (Refer to Windows online help for information on creating a bootable system disk.)
4. Download the Flash Utility and new BIOS file from the manufacturer's Web site. Copy these files to the bootable device.
5. Turn off your computer and insert the bootable device in your computer. (You might need to run the Setup Utility and change the the boot priority items on the Advanced BIOS Features Setup page, to force your computer to boot from the bootable device first.)
6. At the C:\ or A:\ prompt, type the Flash Utility program name and the file name of the new BIOS and then press <Enter>. Example: AFUDOS.EXE 040706.ROM
7. When the installation is complete, remove the bootable device from the computer and restart your computer. If your motherboard has a Flash BIOS jumper, reset the jumper to protect the newly installed BIOS from being overwritten. The computer will restart automatically.

This concludes Chapter 3. Refer to the next chapter for information on the software supplied with the motherboard.

Memo

Chapter 4
Using the Motherboard Software

About the Software DVD-ROM/CD-ROM

The support software DVD-ROM/CD-ROM that is included in the motherboard package contains all the drivers and utility programs needed to properly run the bundled products. Below you can find a brief description of each software program, and the location for your motherboard version. More information on some programs is available in a README file, located in the same directory as the software. Before installing any software, always inspect the folder for files named README.TXT, or something similar. These files may contain important information that is not included in this manual.

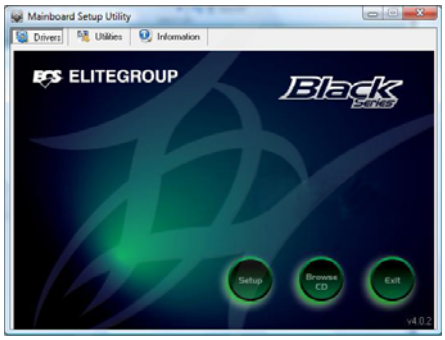
1. *Never try to install all software from folder that is not specified for use with your motherboard.*
2. *The notice of Intel HD audio installation (optional): The Intel High Definition audio functionality unexpectedly quits working in Windows Server 2003 Service Pack 1 or Windows XP Professional x64 Edition. Users need to download and install the update packages from the Microsoft Download Center before" installing HD audio driver bundled in the Driver disk. Please log on to http://support.microsoft.com/default.aspx?scid=kb;en-us;901105#appliesto for more information.*

Auto-installing under Windows XP/Vista/7

The Auto-install DVD-ROM/CD-ROM makes it easy for you to install the drivers and software for your motherboard.

If the Auto-install DVD-ROM/CD-ROM does not work on your system, you can still install drivers through the file manager for your OS (for example, Windows Explorer). Refer to the Utility Folder Installation Notes later in this chapter.

The support software DVD-ROM/CD-ROM disc loads automatically under Windows XP/Vista/7. When you insert the DVD-ROM/CD-ROM disc in the DVD-ROM/CD-ROM drive, the autorun feature will automatically bring up the install screen. The screen has three buttons on it, Setup, Browse CD and Exit.



If the opening screen does not appear; double-click the file "setup.exe" in the root directory.

Drivers Tab

Setup	Click the **Setup** button to run the software installation program. Select from the menu which software you want to install.
Browse CD	The **Browse CD** button is the standard Windows command that allows you to open Windows Explorer and show the contents of the support disk. Before installing the software from Windows Explorer, look for a file named README.TXT or something similar. This file may contain important information to help you install the software correctly. Some software is installed in separate folders for different operating systems, such as Windows XP/Vista/7. Always go to the correct folder for the kind of OS you are using. In install the software, execute a file named SETUP.EXE by double-clicking the file and then following the instructions on the screen.
Exit	The **EXIT** button closes the Auto Setup window.

Utilities Tab

Lists the software utilities that are available on the disk.

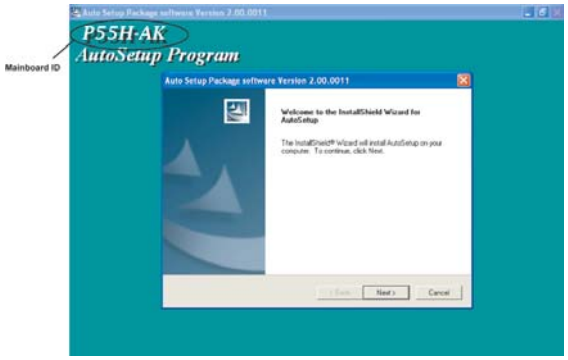
Information Tab

Displays the path for all software and drivers available on the disk.

Running Setup

Follow these instructions to install device drivers and software for the motherboard:

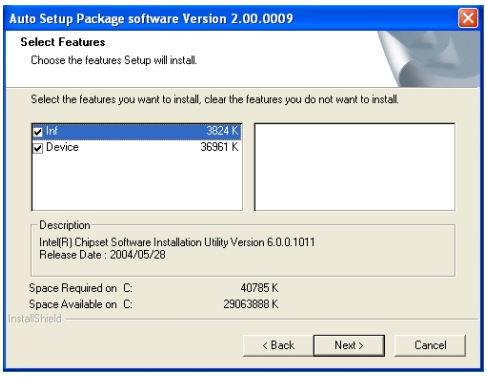
1. *Click **Setup.** The installation program begins:*



The following screens are examples only. The screens and driver lists will be different according to the motherboard you are installing.

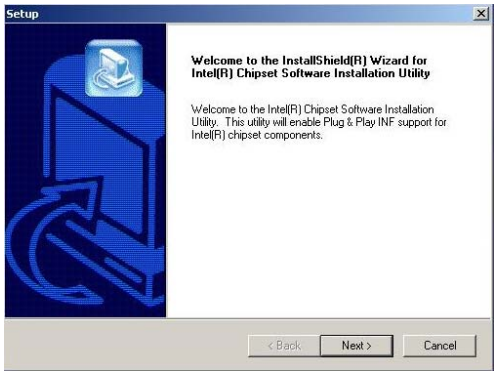
The motherboard identification is located in the upper left-hand corner.

2. *Click **Next.** The following screen appears:*



3. *Check the box next to the items you want to install. The default options are recommended.*

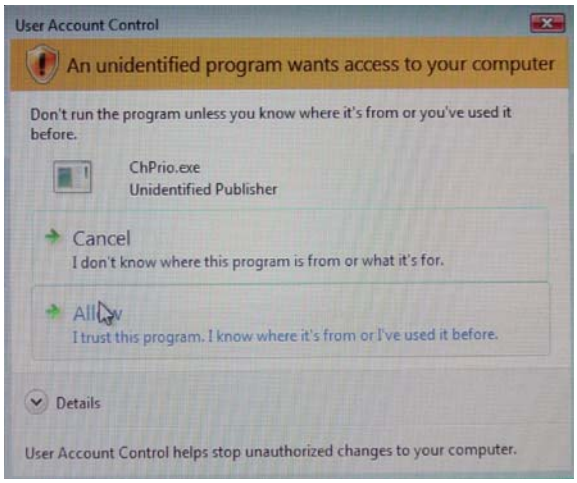
4. *Click **Next** run the Installation Wizard. An item installation screen appears:*



5. *Follow the instructions on the screen to install the items.*

Drivers and software are automatically installed in sequence. Follow the onscreen instructions, confirm commands and allow the computer to restart a few times to complete the installation.

Windows Vista/7 will appear below UAC (User Account Control) message after the system restart. You must select "Allow" to install the next driver. Continue this process to complete the drivers installation.



Manual Installation

Insert the disk in the DVD-ROM/CD-ROM drive and locate the PATH.DOC file in the root directory. This file contains the information needed to locate the drivers for your motherboard.

Look for the chipset and motherboard model; then browse to the directory and path to begin installing the drivers. Most drivers have a setup program (SETUP.EXE) that automatically detects your operating system before installation. Other drivers have the setup program located in the operating system subfolder.

If the driver you want to install does not have a setup program, browse to the operating system subfolder and locate the readme text file (README.TXT or README.DOC) for information on installing the driver or software for your operating system.

Utility Software Reference

All the utility software available from this page is Windows compliant. They are provided only for the convenience of the customer. The following software is furnished under license and may only be used or copied in accordance with the terms of the license.

These software(s) are subject to change at anytime without prior notice. Please refer to the support disk for available software.

This concludes Chapter 4.

Chapter 5

ATI CrossFireX™ Technology Support

This motherboard supports the ATI CrossFireX™ Technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation procedures in this section.

Requirements

1 Two or three identical CrossFireX™ ready graphic cards are needed for the setup of 2-way / 3-way CrossFireX™ configuration.
2 You would need one or two CrossfireX™ bridge cable.
3 Make sure that your graphics card driver supports the ATI CrossFireX™ technology. Download the latest driver from the ATI website (www.ati.com).
4 Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.

Installing CrossFireX™ graphics cards

1. Insert the CrossFireX™ graphics cards into the **PCIEX16** slots. Make sure that the card is properly seated on the slot.

A. For 2-way configuration, install two graphic cards on PCIEX16_1 & PCIEX16_2 and connect them with the CrossFire™ Bridge.

B. For 3-way configuration, two CrossFire™ Bridges are needed to connect the three graphic cards.

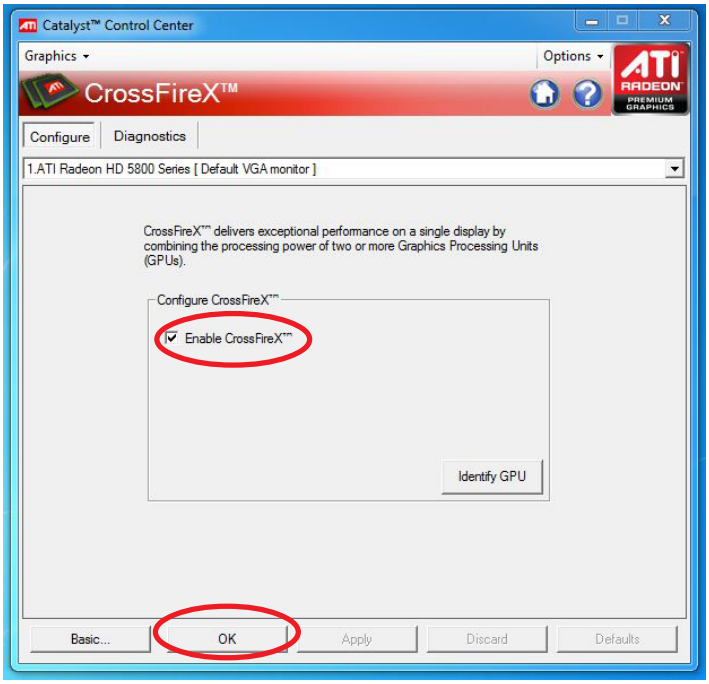
3. Connect the cable from your monitors to the CrossFireX™ ready graphics card installed on the **PCIEX16_1** slot.

4. Connect an auxiliary power source from the power supply to the graphics cards.

The Catalyst™ Control Center Dialog Box

To enable CrossFireX™:

- Install ATI graphic card driver.
- Enter the Catalyst™ Control Center Dialog Box.
- check the "Enable CrossFireX™" item.
- Click OK to apply.



Memo

Chapter 6

NVIDIA® SLI® Technology Support

This motherboard supports the NVIDIA® SLI® Technology that allows you to install multi-graphics processing units (GPU) graphics cards. Follow the installation proce-dures in this section.

Requirements

1. Two or three identical SLI® ready graphic cards are needed for the setup of 2-Way / 3-Way SLI configuration.

2. Make sure that your graphics card driver supports the NVIDIA® SLI® technology.

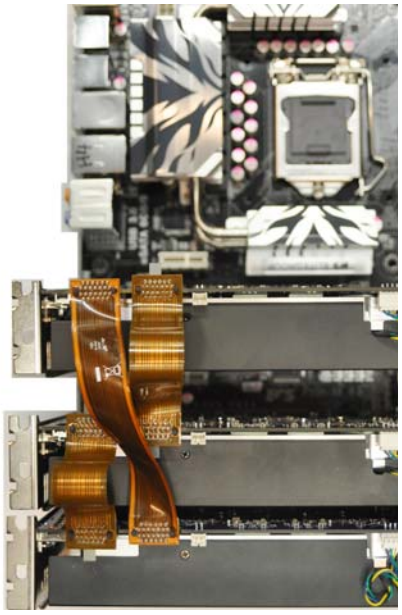
3. Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system.800W PSU is required for the setup of 2-way SLI and 1000W PSU is required for 3-way SLI configuration.

Installing your NVIDIA® SLI-Ready Components

1. Install both of the NVIDIA® SLI-Ready graphics cards.

For 2-Way configuration, install two graphic cards on PCIEX16_1 & PCIEX16_2 and connect them with one SLI bridge.

For 3-Way configuration, three SLI bridges are needed to connect the three graphic cards.



2. Connect the cable from your monitors to the SLI-Ready graphics card installed on the **PCIEX16_1** slot.

Once the new NVIDIA® SLI-certified components have been installed in the system,they will be recognized by the operating system upon Windows boot-up. A Found NewHardware message will be displayed:

Enabling NVIDIA® SLI

1. Click on the SLI capable system message to open the following window.

Description:

All NVIDIA® GPUs work together with SLI technology to increase the rendering performance of your 3D applications.

Typical usage scenarios:

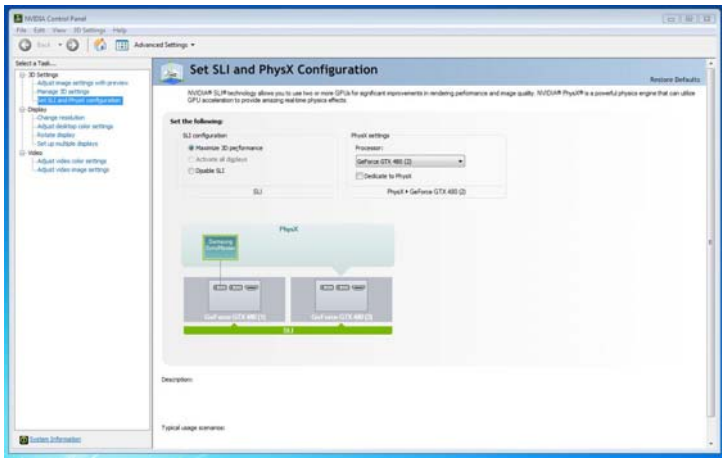
- Playing 3D games
- Using any application that renders hardware-accelerated Direct 3D or OpenGL content.

2. Select the checkbox Enable SLI technology and then click Apply

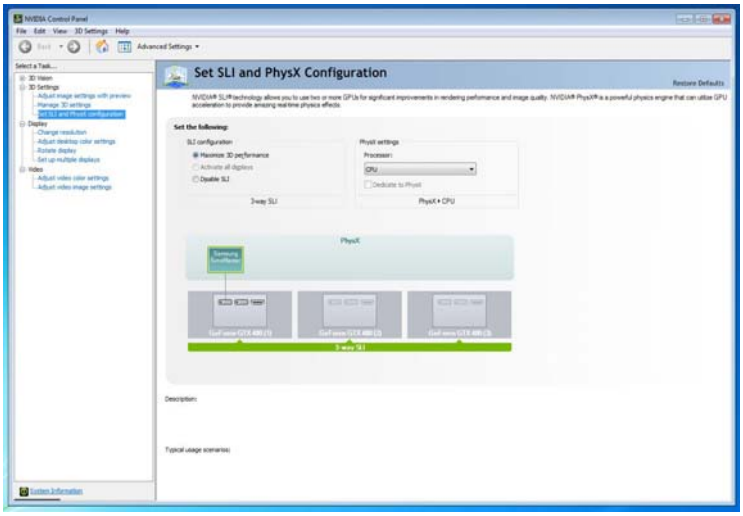
You now have an NVIDIA® SLI-enabled PC!

You can also access these settings by opening the NVIDIA® Control Panel (right-click on desktop), clicking on 3D Settings (shown below) and then selecting "SetSLI configuration".

Control Panel Setting of 2-Way SLI



Control Panel Setting of 3-Way SLI



All in all, the NVIDIA SLI technology works.

This concludes Chapter 6.

Chapter 7
Intel® Matrix Storage Manager RAID Configurations

The Intel® Matrix Storage Manager allows you to configure RAID 0, and 1 sets on the external Serial ATA hard disk drives.

Before creating a RAID set

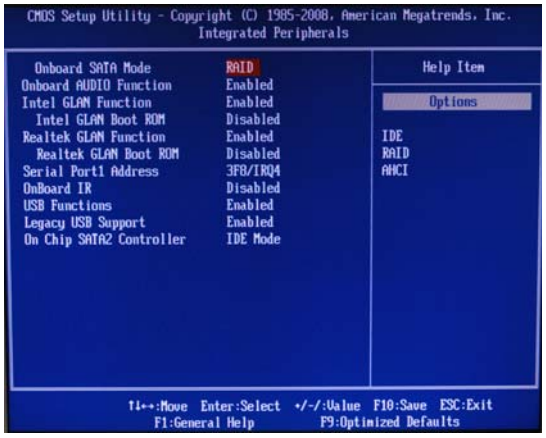
Prepare the following items:

1. One SATA HDD.
2. A write-enabled floppy disk.
3. Microsoft® Windows® OS installation disk (Windows XP/Vista).
4. Motherboard support CD with Intel® Matrix Storage Manager driver.

Complete the following steps before you create a RAID set:

1. Install the external Serial ATA hard disk drive (HDD) on your system.
2. Set the *Onboard SATA Mode* item in the BIOS to *.RAID*..

   See section “Integrated Peripherals” for details.



3. Enter the Intel® Matrix Storage Manager option to set up your RAID configuration.
4. Create an Intel® Matrix Storage Manager driver disk for Windows® OS installation. See section “Creating a RAID driver disk” for details.
5. Install the Intel® Matrix Storage Manager driver after the Windows® OS had been installed.

Entering Intel® Matrix Storage Manager RAID BIOS utility

1. During POST, press <Ctrl-I> to enter the Intel® Matrix Storage Manager RAID BIOS menu.

2. The main Intel® Matrix Storage Manager RAID BIOS menu appears.

3. Use the arrow keys to move the color bar and navigate through the items.

Creating a RAID set

1. In the main Intel® Matrix Storage Manager RAID BIOS menu, highlight *Create RAID Volume* using the up/down arrow key then press <Enter>.

2. When the *RAID Level* item is highlighted, use the up/down arrow key to select the RAID set that you want to create.

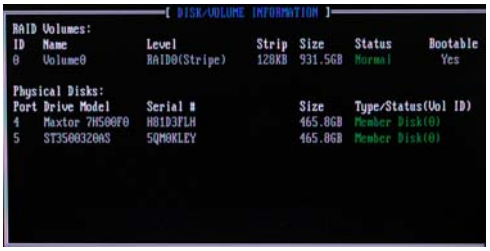
When more than two HDDs are installed in your computer, the *Disks* item will be selectable. Then users can select the HDD that you want to belong to the RAID set. Please be noticed that selecting a wrong disk will result in losing the original data of the HDD.

3. Key in the RAID volume capacity. Use the up/down arrow to choose the *Capacity*. The default value indicates the maximum capacity using the selected disks. Entering a lower capacity allows you to create a second volume on these disks.

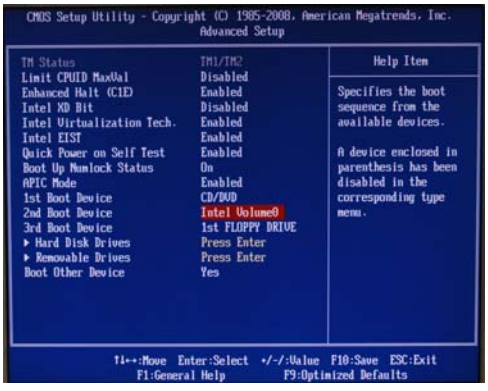
4. When done, press <Enter> to confirm the creation of the RAID set. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

Pressing <Y> deletes all the data in the HDDs.

5. The following screen appears, displaying the relevant information about the RAID set you created.



Users please be noted that RAID 0 (Stripe) is set to accelerate the data access, and RAID 1 (Mirror) is set to provide the data backup. If you want to set RAID 0, you need to set the *2nd Boot Device* item in the BIOS to *Intel Volume0*. See section "Advanced Setup" for details.



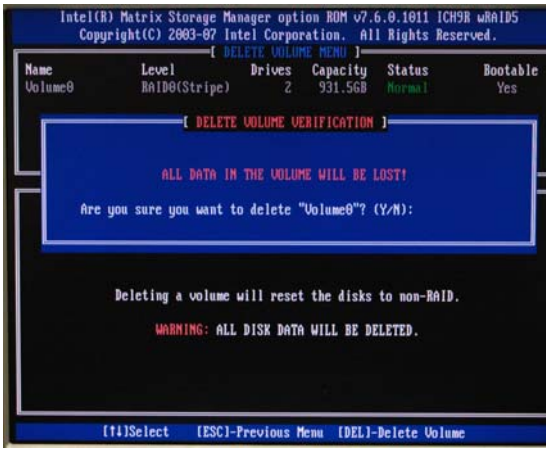
Deleting a RAID set

1. In the main Intel® Matrix Storage Manager RAID BIOS menu, highlight *Delete RAID Volume* using the up/down arrow key then press <Enter>.

2. Use the space bar to select the RAID set you want to delete.

   Press the <Del> key to delete the set.

3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.



Pressing <Y> deletes all the data in the HDDs.

Resetting disks to Non-RAID

An HDD that has been previously configured as part of another RAID set in another platform is called a broken RAID HDD. When you install a broken RAID HDD, you cannot select this disk when configuring a RAID set through the Intel® Matrix Storage Manager option. If you still want to use this broken RAID HDD as part of the RAID set configured through the Intel® Matrix Storage Manager, you may do so by resetting the disk to Non-RAID. You will, however, lose all data and previous RAID configurations.

To reset disks to Non-RAID:

1. In the main Intel® Matrix Storage Manager RAID BIOS menu, highlight *Reset Disks to Non-RAID* using the up/down arrow key then press <Enter>.

2. Use the space bar to select the HDD to reset to Non-RAID.
3. A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N>.

Pressing <Y> deletes all the data in the HDDs.

Exiting Setup

When you have finished, highlight *Exit* using the up/down arrow key then press <Enter> to exit the Intel® Matrix Storage Manager RAID BIOS utility.

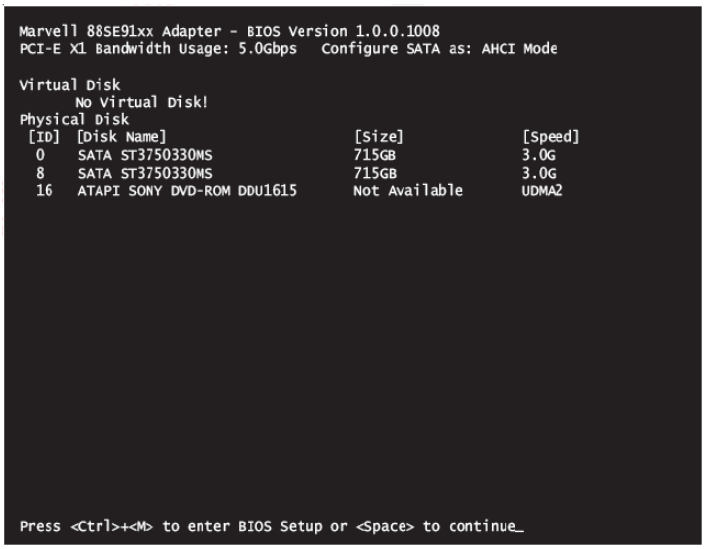
A dialogue box appears to confirm the action. Press <Y> to confirm; otherwise, press <N> to return to the Intel® Matrix Storage Manager RAID BIOS menu.

Chapter 8
Marvell 88SE9128 SATA 6Gb/s RAID Controller BIOS Setup

The 88SE9128 controller supports the creation of RAID 0 and RAID 1 virtual disks comprising of exactly two SATA physical disks.

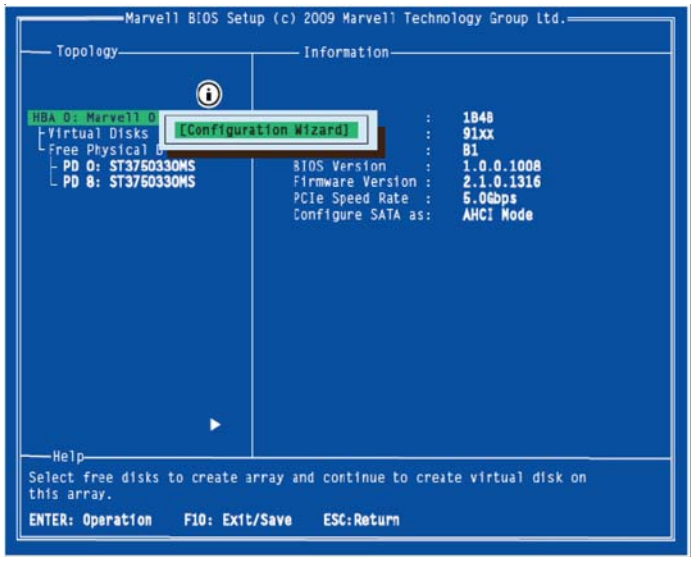
The following shows the messages displayed during the POST of P55H-AK motherboard.

Press **<Ctrl>** + **<M>** to launch Marvell BIOS Utility**.**

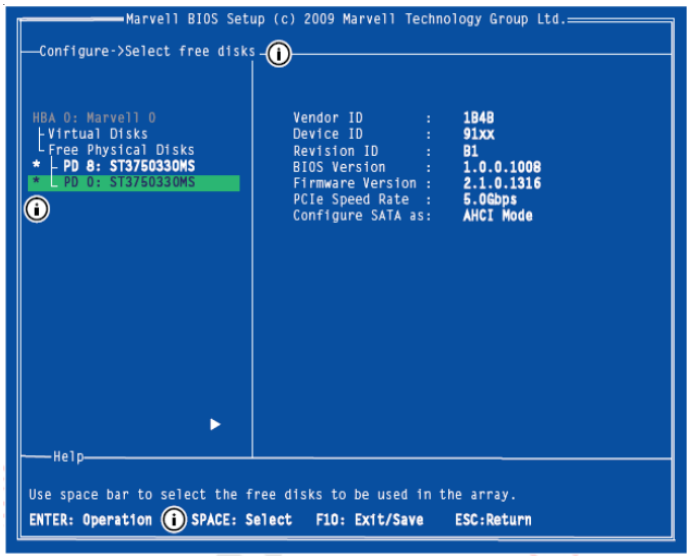


To Create Virtual Disks

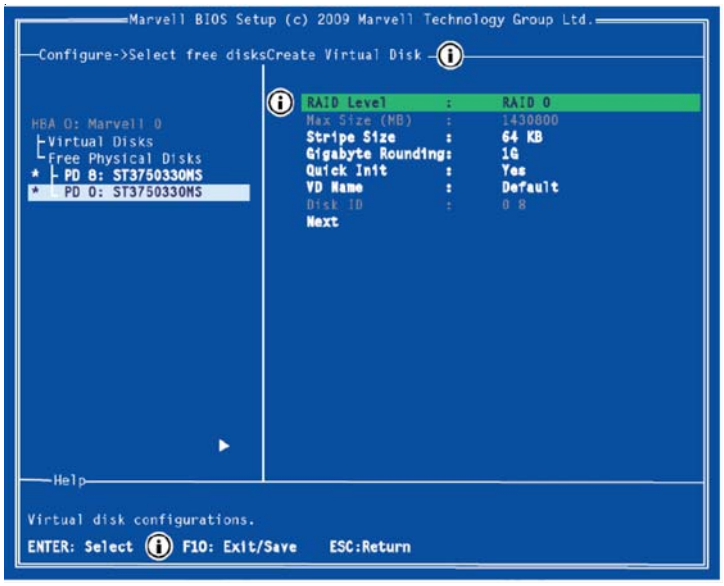
1. Enter the **Topology** pane, scroll the **HBA 0: Marvell 0**. Press **Enter** to select **Configuration Wizard** to begin creating the virtual disk.



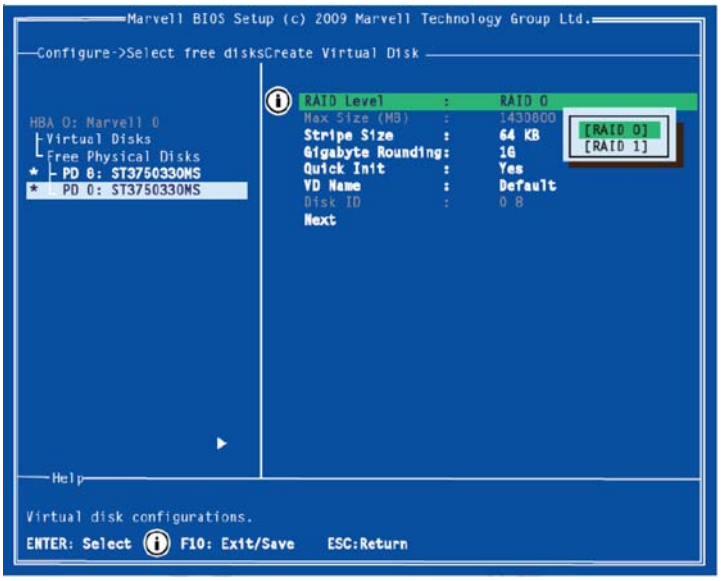
2. Use the arrow keys to scroll the list of free disks. Press **Space** to select/unselect a disk and press **Enter** to continue. An asterisk will appear to the left of the selected disks.



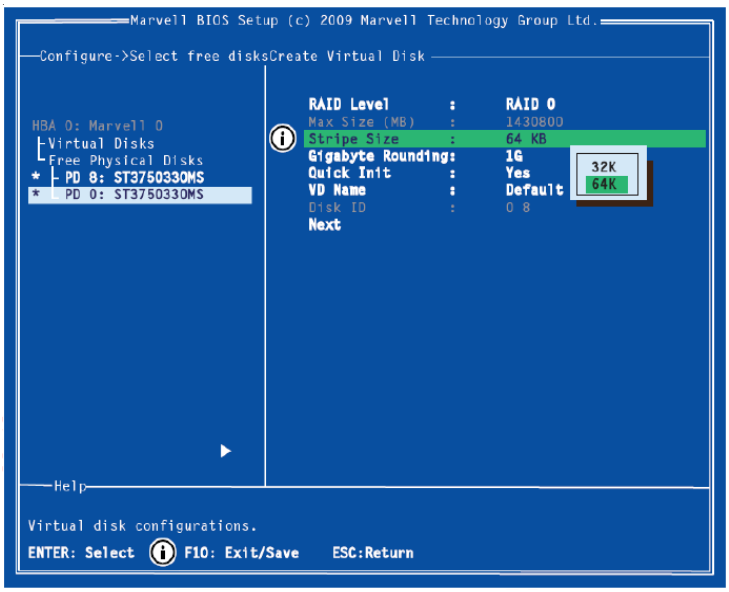
3. Create **Virtual Disk** by configuring its settings in the Information pane.



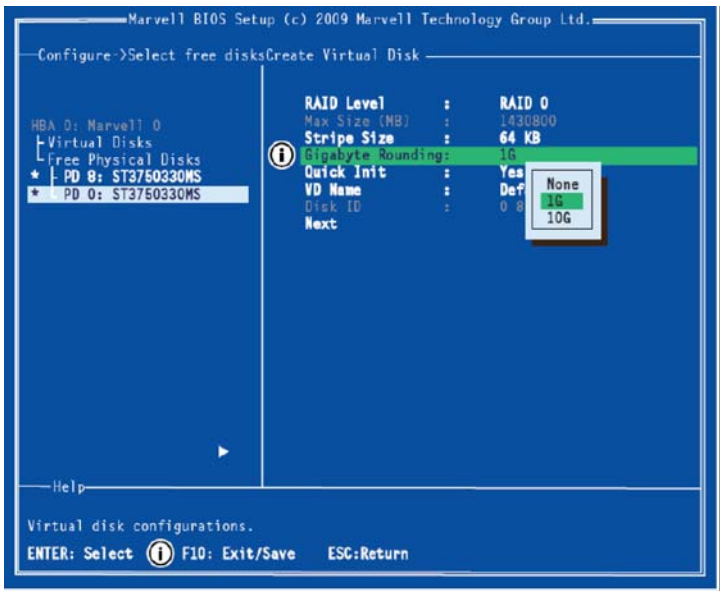
4. Press **Enter** to select a **RAID Level** (RAID 0, RAID1).



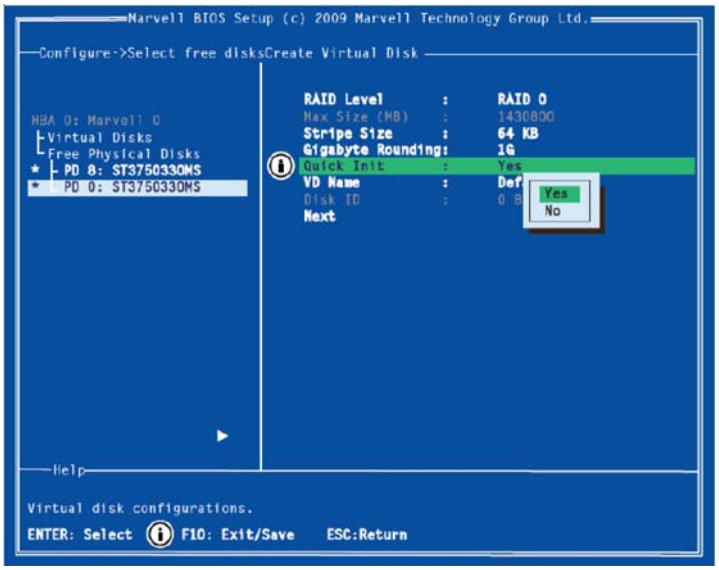
5. Scroll to **Stripe Size** and press **Enter** to select 32K or 64K for the selected RAID Level.



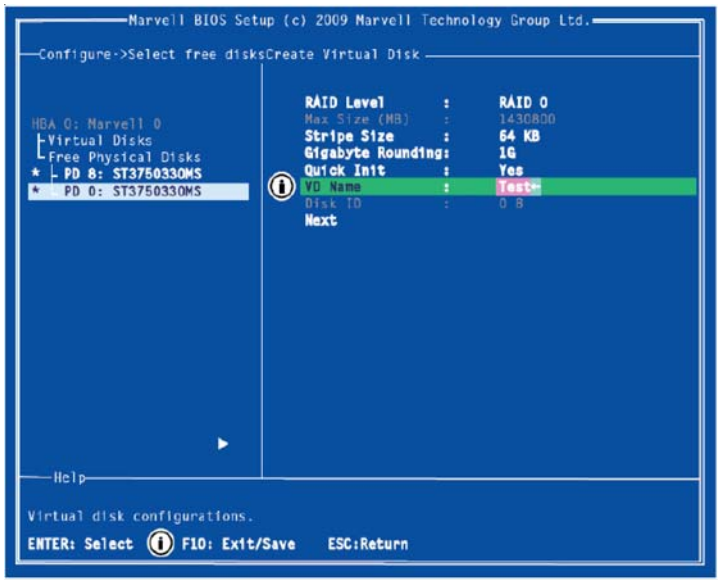
6. Scroll to **Gigabyte Rounding** and press **Enter** to select None, 1G or 10G.



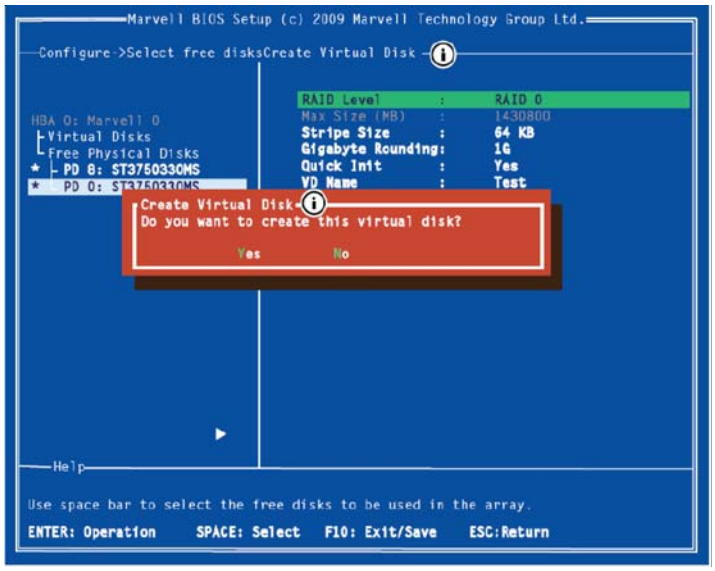
7. Scroll to Quick Init and press **Enter** to select Yes or No.



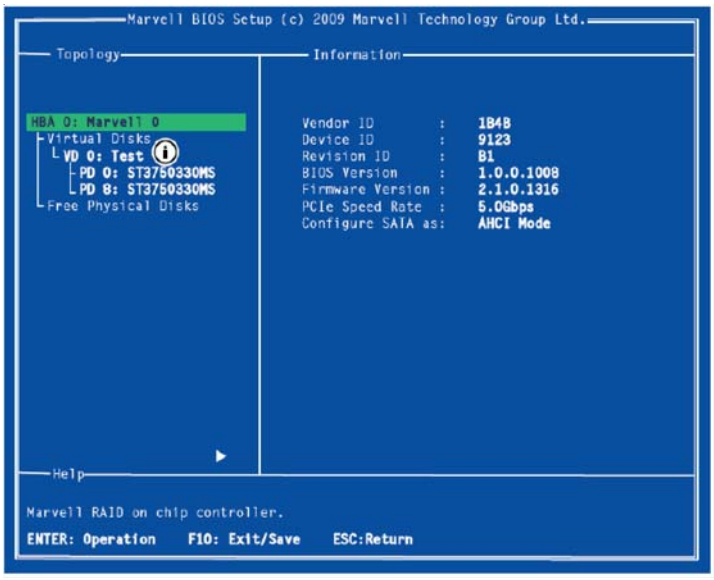
8. Scroll to **VD Name** to type a new name, and press **Enter** to confirm the selection.



9. Scroll to **Next** and press **Enter** to create the virtual disks after configuring the virtual disk. Then press **Y** to select **YES.**



The virtual disk is now listed in the **Topology** pane.



Chapter 9
Trouble Shooting

Start up problems during assembly

After assembling the PC for the first time you may experience some start up problems. Before calling for technical support or returning for warranty, this chapter may help to address some of the common questions using some basic troubleshooting tips.

a) System does not power up and the fans are not running.

1.Disassemble the PC to remove the VGA adaptor card, DDR memory, LAN, USB and other peripherals including keyboard and mouse. Leave only the motherboard, CPU with CPU cooler and power supply connected. Turn on again to see if the CPU and power supply fans are running.

2. Make sure to remove any unused screws or other metal objects such as screwdrivers from the inside PC case. This is to prevent damage from short circuit.

3. Check the CPU FAN connector is connected to the motherboard.

4. For Intel platforms check the pins on the CPU socket for damage or bent. A bent pin may cause failure to boot and sometimes permanent damage from short circuit.

5. Check the 12V power connector is connected to the motherboard.

6. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

b) Power is on, fans are running but there is no display

1. Make sure the monitor is turned on and the monitor cable is properly connected to the PC.
2. Check the VGA adapter card (if applicable) is inserted properly.
3. Listen for beep sounds. If you are using internal PC speaker make sure it is connected.
   a. continuous 3 short beeps : memory not detected
   b. 1 long beep and 8 short beeps : VGA not detected

c) The PC suddenly shuts down while booting up.

1. The CPU may experience overheating so it will shutdown to protect itself. Ensure the CPU fan is working properly.
2. From the BIOS setting, try to disable the Smartfan function to let the fan run at default speed. Doing a Load Optimised Default will also disable the Smartfan.

Start up problems after prolong use

After a prolong period of use your PC may experience start up problems again. This may be caused by breakdown of devices connected to the motherboard such as HDD, CPU fan, etc. The following tips may help to revive the PC or identify the cause of failure.

1. Clear the CMOS values using the CLR_CMOS jumper. Refer to CLR_CMOS jumper in Chapter 2 for Checking Jumper Settings in this user manual. When completed, follow up with a Load Optimised Default in the BIOS setup.

2. Check the CPU cooler fan for dust. Long term accumulation of dust will reduce its effectiveness to cool the processor. Clean the cooler or replace a new one if necessary.

3. Check that the 12V power & ATX connectors are fully inserted into the motherboard connectors. Make sure the latches of the cable and connector are locked into place.

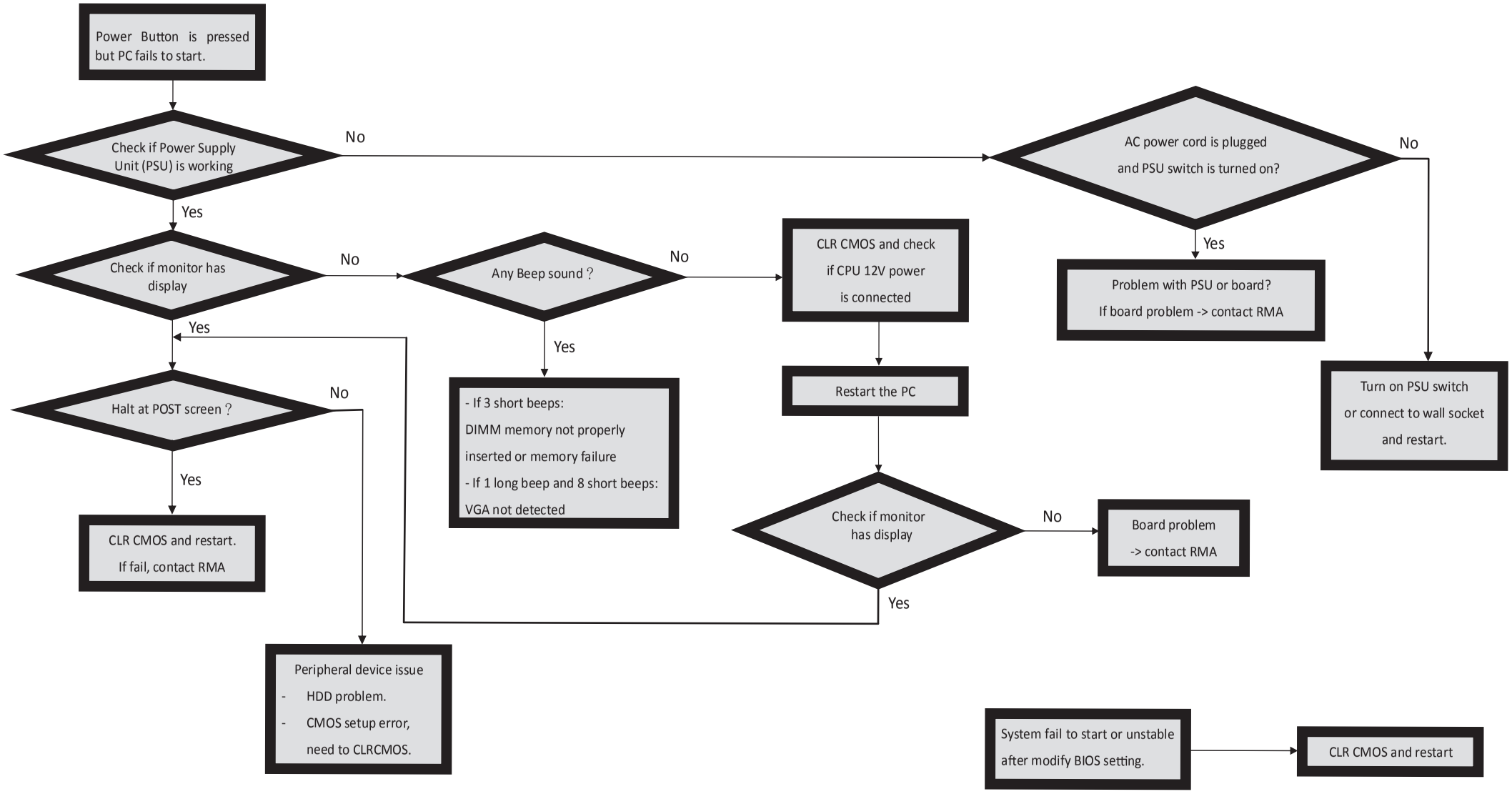
4. Remove the hard drive, optical drive or DDR memory to determine which of these component may be at fault.

Maintenance and care tips

Your computer, like any electrical appliance, requires proper care and maintenance. Here are some basic PC care tips to help prolong the life of the motherboard and keep it running as best as it can.

1. Keep your computer in a well ventilated area. Leave some space between the PC and the wall for sufficient airflow.
2. Keep your computer in a cool dry place. Avoid dusty areas, direct sunlight and areas of high moisture content.
3. Routinely clean the CPU cooler fan to remove dust and hair.
4. In places of hot and humid weather you should turn on your computer once every other week to circulate the air and prevent damage from humidity.
5. Add more memory to your computer if possible. This not only speeds up the system but also reduces the loading of your hard drive to prolong its lifespan.
6. If possible, ensure the power cord has an earth ground pin directly from the wall outlet. This will reduce voltage fluctuation that may damage sensitive devices.

Basic Troubleshooting Flowchart



Memo

POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS :

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer.Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
C0	Early CPU Init Start -- Disable Cache - Init Local APIC
C1	Set up boot strap processor Information
C2	Set up boot strap processor for POST
C5	Enumerate and set up application processors
C6	Re-enable cache for boot strap processor
C7	Early CPU Init Exit
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM

	module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8D	Build ACPI tables (if ACPI is supported)
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).
61-70	OEM POST Error. This range is reserved for chipset vendors & system manufacturers. The error associated with this value may be different from one platform to the next.